FOREST RESOURCES COMMISSION

The Future of Our Forests

Executive Summary

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FOREST RESOURCES COMMISSION

THE FUTURE OF OUR FORESTS

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EXECUTIVE SUMMARY

A.L. (Sandy) Peel, Chairman

APRIL 1991

Forest Resources Commisssion

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April 15, 1991

The Honourable Claude Richmond
Minister of Forests
Parliament Buildings
Victoria, B.C. V8V 1X4

Dear Mr. Richmond:

You asked the Forest Resources Commission to enquire into and provide you with advice on four specific matters respecting the forests of British Columbia. The Commission has completed its review of these matters in accordance with the Terms of Reference given to it and, herewith, respectfully submits its first full report.

Yours sincerely,

A. L. (Sandy) Peel
Chairman

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1. INTRODUCTION

A little less than two years ago, the British Columbia Forest Resources Commission was asked to examine the state of the province's forest land base and recommend improvements to the way it is managed.

It was a daunting task. The forests, the lakes, the rivers, the mountains — they are the heart and soul of the social and economic fabric of this province. Everyone in British Columbia has a stake in their welfare, and everyone is keenly interested in improving the way the activities that impact upon them are managed. Thousands talked to us — either directly in the many forums and public meetings held throughout the province, or in written submissions. All of us on the Commission are grateful for their contribution.

The messages they gave the Commission were as complex and varied as the people themselves, but one theme underlined virtually everything we heard — the status quo is not good enough. The way the forests and their many values are currently being managed by government and industry is out of step with what the public expects. It must change.

Driving the current level of dissatisfaction is a dramatic shift in society's values. Once valued only for their economic worth, the forest resources now represent a much wider range of values — aesthetic, environmental, social, spiritual, and many more. That shift in values underlies much of the conflict that has dominated the debate over forest resources in the last few years.

Very early in the exercise, the Commission recognized that any changes in the way the forests are managed to reflect a full range of values will depend on an all-encompassing vision of what we want from our forests and what are acceptable practices to get us there. That Vision Statement is a simple statement of principle that has led to many recommendations for change.

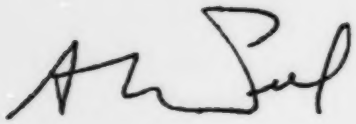
The key phrase in the Vision Statement — and you will see it used again and again in the rest of this report — is **enhanced stewardship**. The Commission believes that the public's desire to see a full range of values reflected in our forests can be realized in one of two ways. Either large portions of forest land can be withdrawn from commercial exploitation to protect and preserve certain non-timber values, or it can all be managed more effectively to maintain or even improve the production of all values. We have concluded that the greatest benefit to all British Columbians will not come from significantly reducing commercial activity in our forests, with the resultant loss of jobs, negative community impact and reduced government revenue. Rather, it will come from managing our forests better for all values

Enhanced stewardship means recognizing that in addition to timber values, values such as cattle production, water quality, recreation, wildlife, wilderness, and aesthetics should all be maximized through proper forest management. It means making choices about the relative importance of any one of those values with a full understanding of the impacts on the others, and in a way that not only preserves them, but enhances them. It means understanding the full range of economic and social costs and benefits associated with any decisions about resource management.

This shift from managing primarily for timber values to managing for all values requires significant change in how we plan, manage, and finance the activities that are carried out

in our forests. The components and resulting recommendations outlined in the following chapters are like pieces in a jigsaw puzzle — they all come together to form one vision of enhanced stewardship. Leave some pieces out, and the vision is not complete.

British Columbians have an opportunity — a great opportunity — to grasp the vision of enhanced stewardship for our forests so that successive generations may benefit from and enjoy the full range of values that our forests can provide.



A. L. (Sandy) Peel
Chairman

2. VISION STATEMENT

The forests of British Columbia have become a focus of economic, environmental and social conflict.

Long taken for granted as the engine driving the economic growth of the province and providing financial and material benefits for us all — they have suddenly been overtaken by a dramatic shift in values. People now recognize a wide range of forest values that have little to do with economics or material wealth. Such things as pristine wilderness, environmental protection, water quality, recreation — and a host of others — are seen as equally important to economic security. Many feel those values should in fact take precedence over the traditional resource values that have served the province so well.

As with any significant shift in values, there is conflict. Those who defend the old values point, with a large body of evidence to support them, to the tremendous wealth created by resource extraction. They argue convincingly of the need to continue down that path, and speak confidently of our ability, through prudent forest renewal practices, to maintain that industrial capacity. Those who place new values ahead of the old argue, with equal conviction, of the need to halt the commercial exploitation of the forests and to preserve what hasn't been liquidated before it is too late. They put environmental quality and preservation ahead of economics.

There is truth in both arguments. What has been lacking is any real effort on the part of society, in general, to discover if there is a formula for forest management that will reflect both points of view. Is there a way to chart a course that will recognize and encourage the new values while maintaining the benefits of the old? Hence the conflict.

The Forest Resources Commission believes there is a better way. After hearing the views of thousands of dedicated British Columbians, the Commission has developed a vision of the future that provides that formula. By embracing the ethic of ENHANCED STEWARDSHIP British Columbians can achieve the full potential of all values in our forests of the future. This means intensive, integrated management for all values on the largest forest land base possible. In this way:

> ***the forests of British Columbia will provide for the economic, environmental, social, and spiritual well-being of all British Columbians through successive generations.***

Acceptance of this vision requires change. We must now cooperatively manage our forests in a truly integrated fashion that considers all the values that society deems are important. Land use must be planned, and decisions on its use based on accurate and complete information about what it can biologically produce. Such comprehensive management requires a stable financial commitment. All points of view must have access to the process. Perhaps most important of all, people must be prepared to participate fully in the decision making process.

The forests of British Columbia are unique and have the potential to provide us all with lifestyles that reflect a tremendous range of values — perhaps even values as yet undiscovered. The vision outlined here, and detailed in the following sections of this report, will be a challenge for British Columbians. But the rewards of meeting that challenge are immense.

3. LAND USE PLANNING

A Blueprint for Diversity

The effective use of land and its resources has, from the beginning of time, shaped our progress and evolution. With that in mind, the Forest Resources Commission believes that any effort to protect and enhance the many values represented by British Columbia's land base must begin with a comprehensive Land Use Plan. From that plan, and fully integrated with it, will flow a variety of management systems designed to make the best use of all those values.

Two important factors have now combined to require a new, more integrated approach to land use planning. Through a systematic awarding of resource rights over the last century, nearly all the provincial land base has been allocated to one or more forms of specific resource use. And social values have changed dramatically.

The Forest Resources Commission has concluded that a comprehensive Land Use Plan is required to accommodate that new, fuller range of values, and to allow the introduction of additional values as society changes its outlook. The Land Use Plan will be a blueprint for managing this change.

The Commission has also concluded that the Land Use Plan must apply to the entire province.

The Forest Resources Commission firmly believes that the Land Use Plan will provide the best opportunity for the people of British Columbia, through their elected government, to establish the goals and priorities essential for the protection and enhancement of all values associated with the land and the resources it holds.

The public has a role to play in the planning process at key points in the proposed land use planning structure.

The process envisaged for the Land Use Plan must be open, neutral and balanced. The Forest Resources Commission believes a restructured Ministry of Crown Lands, with a mandate to ensure the optimum balance of activities on all provincial Crown lands, should coordinate all land use planning functions. The Forest Resources Commission has concluded that a thorough review is required to identify whatever legislative amendments will be necessary to ensure that all government ministries are fully supportive of the new process and that their involvement is rationalized.

The Forest Resources Commission recommends that:

1. **the Government of British Columbia introduce comprehensive land use planning for the total land base of the province;**

2. **the government enact legislation giving a restructured Ministry of Crown Lands a broader mandate to ensure the optimum balance of activities on all Crown lands and to implement and administer the Land Use Plan;**

3. **the government review and amend the legislation of all ministries with responsibilities pertaining to the land base of the province to ensure both their involvement and support of comprehensive land use planning;**

4. **that public involvement be set out in legislation and cover all aspects of the planning process.**

Organization of the Planning Process

Any organizational structure designed to carry out an effective Land Use Plan in the province must take the province's geographic and demographic diversity into account. To that end, the Forest Resources Commission has concluded that a multi-tiered process for creating and implementing the Land Use Plan is required.

A Land Use Commission is proposed that will report to the Cabinet Committee on Sustainable Development through the Minister of Crown Lands. The Land Use Commission will assist in developing broad goals and objectives, provide a neutral forum for information, discussion and research on Land Use Plans, and make recommendations to government on the range of values to be considered in making land use decisions.

Detailed planning will be carried out by Local Planning Groups which report ultimately to the Land Use Commission. The Local Planning Groups, comprising professional resource staff as well as private interests and user groups, will develop the detailed plans for land use throughout the province, making assessments of values and priorities throughout.

Land Use Commission

Government must establish the values that will be identified in the plan and set goals for the Commission to meet in the attainment of these values. The Land Use Commission should have a limited number of appointments, and these should reflect a regional and sectoral balance. Legislation establishing the Land Use Commission must also provide for an independent Appeal Board to mediate and settle disputes.

Regional Planning Groups

The Forest Resources Commission believes that there may be a role for Regional Planning Groups. The Land Use Commission should decide this issue and, if necessary, determine the appropriate number of Regional Planning Groups and the land base they should reflect.

Local Planning Groups

The Local Planning Group will be responsible for assessing the technical, biological and physical attributes of the land base in order to determine its capabilities and value attributes. The Commission believes that the Ministry of Forests' existing Forest Districts provide an appropriate land base for these Local Planning Groups.

The Planning Process

The planning process will be acceptable to the public only if it is open, and is seen to be open. All levels of the planning process must use procedures that are well understood and justifiable. Reasons behind technical judgments and the information that was used to make decisions must be made available to all interested parties.

It is recommended that the Land Use Commission be given legislated authority to make decisions on land use classifications for values and uses that fall within the provincial goals. An independently-appointed, three-member Appeal Board should handle disputes among users within approved plans.

The Forest Resources Commission recommends that:

5. **a Land Use Commission be created by appropriate legislation and charged with implementing the land use planning process;**

6. **with the assistance of the Land Use Commission, the Province assess the capabilities of the land base to support particular values and then define its goals for various values within those constraints. The contribution of the various areas of the province to these goals should be refined at the local level;**

7. **the Land Use Commission report to the Cabinet Committee on Sustainable Development through a restructured Ministry of Crown Lands;**

8 **the Land Use Commission be given legislated authority to make recommendations to Cabinet on land use classifications for values and uses that fall within provincial goals. It should also develop a mediation and dispute settlement process;**

9. **with respect to areas of substantial land use classification conflict, it will be the responsibility of the Land Use Commission to determine the information that will be required to resolve these conflicts;**

10. **where resolution of specific Land Use Plan classifications cannot be mediated because of unresolved issues, the ultimate decision on use should await the completion of the province-wide Land Use Plan to determine compatibility with provincial goals;**

11. **only those land use proposals that cannot be resolved through the planning process, or that do not fall within established goals and land classifications, should proceed to Cabinet for resolution;**

12. **legislation establishing a Land Use Commission should provide for an independently-appointed, three-member Appeal Board to adjudicate disputes among users within approved plans, and to report its findings to the Commission;**

13. **the Land Use Commission be responsible for deciding whether or not Regional Planning Groups are needed and, if so, determine their make-up, area coverage and responsibilities;**

14. **the Local Resource Planning Groups use the existing Forest District boundaries as their initial planning bases.**

Technical Support

Professional Staff

The Land Use Plan will require a large amount of technical support from professionals in a wide range of resource areas. The initial planning and assessment process will rely upon the professional and technical expertise that is available in government ministries and upon other knowledgeable user groups and individuals.

Inventories

Good inventory information is vital to the land use planning process. The Forest Resources Commission believes that priorities for the development of resource inventories should be determined by the Ministry of Crown Lands. Funds would be allocated among the various resource ministries based on the need for basic information. The Ministry of Crown Lands should be responsible for dealing with requests from the public for inventory information.

The Commission has concluded that the resource boundaries for inventory development must be rationalized to provide compatible land base coverage. The Ministry of Crown Lands, as the ministry responsible for land use planning, should be empowered to administer this task. Planning can start at the local level using existing information and local knowledge. The data base can be improved as the process is developed.

Land Use Classification

The Forest Resources Commission believes that the goals of the province will be best achieved through assigning the maximum amount of land to integrated use classifications. For a detailed breakdown of proposed classifications see the full report.

The Forest Resources Commission recommends that:

15. **the Local Resource Planning Groups utilize the technical and professional expertise in existing resource ministries, as well as expertise available in private user groups and other individuals;**

16. **the budgets for the development of resource inventories be assigned to the Ministry of Crown Lands, for allocation on a priority basis among the various resource ministries;**

17. **the Ministry of Crown Lands be responsible for handling requests from the public for inventory information on all Crown lands;**

18. **the Ministry of Crown Lands take the lead in rationalizing the resource boundaries for land capability analysis to provide compatible land base coverage;**

19. **the technical land capability information that will lead to land use classifications be developed for the entire province;**

20. **the land use classifications that were developed in the Forest Resources Commission's workshops on the Options Paper form the basis for the classifications used in the Land Use Plan;**

21. **existing land use classifications for such areas as parks be reviewed in order to ascertain whether they are appropriate in view of the comprehensive review of the total provincial landscape.**

Implementation of the Land Use Plan

The basic plan can be implemented through legislative action and through the establishment of the various planning mechanisms outlined. A combination of existing inventory information and local knowledge should be sufficient to develop plans if the goals and guidelines have been determined. A two-year timetable is considered reasonable for the completion of district plans through the Local Planning Groups. The planning that is presently being undertaken by the government for parks, ecological reserves, wilderness areas, old-growth preserves, and other such initiatives must be developed in conjunction with the overall Land Use Plans.

The existence of a Land Use Commission with a mandate to administer the planning function for the entire provincial land base calls into question the need for a separate, single-function Agricultural Land Commission.

The Forest Resources Commission recommends that:

22. **a two-year timetable be established for completion of all district Land Use Plans.**

23. **the current planning for parks, ecological reserves, wilderness areas, old growth forest preserves and other similar planning activities be developed in conjunction with the overall Land Use Plan, and be considered by the Land Use Commission as part of its overall planning responsibilities.**

24. **consideration be given to absorbing the Agricultural Land Commission into the new Land Use Commission.**

4. A MANAGEMENT AND FINANCIAL STRUCTURE

"Management and finance of forest property belonging to the Province have both become intricate problems."
Report of Royal Commission on Forestry; 1910

A Framework for Enhanced Stewardship

In the past, the commercial values of the forest were the primary values to be considered. Now, other values have become at least equal to, and in many cases take precedence over, the traditional economic values of the forests. That has created two important requirements that must now be addressed. We require an administrative structure that will allow the true integration of the full range of forest values as set out in the land use plans. The structure must relate not only to the commercial forest lands of the province, but also to the non-commercial forests and range lands. We further require the means to secure stable, long-term funding that will guarantee the enhanced stewardship necessary to carry out the entire plan.

The policy and regulatory functions in a number of ministries currently representing a wide range of forest values should be grouped under one new ministry -- the Ministry of Renewable Natural Resources.

Society's demands for recognition of a broader range of forest values will significantly increase the pressure on what has been the traditional commercial forest. The forests' contribution to the reflection of those values will require a firm and unassailable commitment to enhanced stewardship. As well, the commercial forest must be administered in a way that maximizes its economic potential.

The Forest Resources Commission has concluded that the province must come to grips, once and for all, with the need for an adequate funding base for forest renewal and management. The only legal entity with the broad powers needed for the job is a Crown Corporation — the Forest Resources Corporation. Established by legislation, it can collect revenue, borrow money when necessary, manage the forest and pay dividends to the government. The Forest Resources Corporation will be able to finance the stewardship requirements of the province's forests. It will report to the Cabinet Committee on Sustainable Development through the Minister of Renewable Natural Resources.

The Forest Resources Commission recommends that:

25. the Government of British Columbia establish a new Ministry of Renewable Natural Resources to replace the Ministry of Forests and take on an expanded role in the policy, regulation and general administration of the forest and range lands of the province;

26. **a Forest Resources Corporation be established through legislation to finance and manage the public's commercial forest land base;**

27. **the Minister of Renewable Natural Resources be responsible for the Forest Resources Corporation.**

The Ministry of Renewable Natural Resources — Organization and Responsibilities.

The Forest Resources Commission found that at least 13 government ministries had mandates or responsibilities flowing from or attributable to the forest land base. Integrated management becomes extremely difficult with such a widespread dispersal of authority.

The Commission has concluded that those integrated use management areas (as defined by the Land Use Plan) with the potential for commercial timber production should be administered by the new Forest Resources Corporation. The new Ministry of Renewable Natural Resources should be given the mandate to manage for these key resource values on those provincial forest lands that are not assigned to and managed by the Forest Resources Corporation.

Essentially, the new Ministry of Renewable Natural Resources will handle policy and regulatory functions and manage those lands for fish and wildlife, water, forest and range functions that are not under the jurisdiction of the Forest Resources Corporation. Other ministries with responsibilities that impact on the forest land base should have their activities coordinated by a single act of the Legislature.

The Fish and Wildlife Division will provide the government with advice on management practices and goals for these values under the Land Use Plan. It will manage these values on non-commercial forest lands and on other Crown lands.

The Water Management Division will continue to be responsible for water supply management, water quality management, and flood and erosion control.

The Chief Forester will take on a new title — Provincial Forester — and an expanded role, a role seen as critically important by the Forest Resources Commission. The independence of the Chief Forester and the ethic that the Forest Service developed provided an important balance between the government, the industry and the public interest in forest management and conservation. The position and responsibilities of Provincial Forester should be structured so that the Provincial Forester is seen to be impartial and to represent all values in forest management on all Crown lands. The Provincial Forester should be required by legislation to make annual reports direct to the legislature on the state of the forests.

The Forest Resources Commission recommends that:

28. **the Ministry of Renewable Natural Resources be made responsible for policies and regulations related to the key values of timber, water management, range, recreation, and fish and wildlife. The land base managed by the Ministry will be those lands not allocated to the Forest Resources Corporation;**

29. **the management for all forest values by government ministries be coordinated by a single act that ensures that their repective mandates are supportive of integrated resource management and enhanced stewardship;**

30. **there be Assistant Deputy Ministers respectively for fish and wildlife and for water management;**

31. **there be a Provincial Forester at an Assistant Deputy Minister level responsible for all forest related matters other than fish and wildlife and water management;**

32. **the Provincial Forester assume responsibility for policy, research, regulatory staff from the Ministry of Forests and the integrated resources and conservation staff of the Ministry of Environment;**

33. **the Provincial Forester be required to report annually direct to the legislature on the state of the forests.**

Financing Forest Resource Management: A Forest Resources Corporation

The Forest Resources Commission believes the management of the forests requires a long-term commitment with a stable source of funding. Without the financial ability to provide the necessary level of enhanced stewardship through integrated resource management to meet approved goals, the land use planning proposals will have little value.

The Forest Resources Corporation recommended by this Commission represents the strongest mechanism available to secure stable, long-term funding for enhanced forest stewardship. The Corporation should be run by a Board of Directors with no more than 15 members representing all regions and sectors.

The direct revenues that are drawn from the forests must be used to manage, renew and replace the forests for future generations. The Corporation must be given the ability to charge for all the commercial consumptive uses of these lands and receive all direct commercial revenues from resources under its jurisdiction. It should also be able to borrow against its assets — the trees.

The Commission has concluded that the cost of management for non-commercial values should be recognized and be borne by the government out of general revenue — not out of the revenues of the Forest Resources Corporation.

The Forest Resources Commission has concluded that awarding secure rights to tenure holders for individual tracts of public land will provide the most efficient means of managing the resources. The Forest Resources Corporation should be empowered through legislation to enter into legally binding stewardship contracts with private companies or individual forest resource managers. Resource managers must be accountable for their management practices, and must submit to independent audits to provide an objective assessment of their performance.

The Forest Resources Commission believes the province should now move away from administered stumpage prices towards a system of market prices determined through the

development of a province-wide log market. In essence, the province-wide log market will permit the efficient allocation of logs to their highest and best use.

The Forest Resources Corporation should eventually be required to pay a dividend to government. However, that dividend must be calculated after all the financial requirements of enhanced stewardship are met.

The Forest Resources Commission recommends that the Forest Resources Corporation:

34. **be charged with the responsibility for such commercial Crown forest and range lands that are designated as Integrated Use Management Areas under the Land Use Plan;**

35. **have a representative Board of Directors of up to 15 members;**

36. **receive all direct commercial revenues from all resources under its jurisdiction;**

37. **be empowered with the ability to borrow against its assets as represented by the standing commercial timber under its jurisdiction;**

38. **be empowered to enter into legally-binding contracts, including stewardship contracts;**

39. **be empowered to undertake the management of non-commercial forest values and undertake socially desirable practices for the government in return for an annual appropriation that covers costs;**

40. **be empowered to pay a dividend to government;**

41. **be responsible for requiring independent audits of the performance of tenure holders for compliance with Resource Management Agreements, and for having such audits conducted on its own management performance;**

42. **assume the Operations Division, Valuation, Industry Development, Planning, and Silviculture Branches, and Inventory field staff of the Ministry of Forests, as well as most of the field staff of the Fish & Wildlife and Water Management Divisions of the Ministry of Environment;**

43. **as part of its mandate, establish a province-wide competitive log market.**

5. TENURE

FOREWORD:

The Forest Resources Commission believes the content and recommendations contained in this chapter should be published in the form of a white paper.

Resource Tenures — Introduction

Today, the forest land base is essentially fully committed to widely varied and overlapping user groups — all with one form of tenure or another. How those tenures are awarded and integrated is fundamental to the Vision Statement's concept of enhanced stewardship of public lands.

The Role of Tenure and Timber Harvesting

The two main types of tenures in B.C. represent different philosophies of forest management. In a Tree Farm Licence, the philosophy is based on an assumption that harvesting rights approaching those of private land ownership offer the best incentive to practise enhanced stewardship and assure community stability. Forest licences issued under a Timber Supply Area follow the philosophy that "bottom line" motivated private companies are concerned, first and foremost, with timber supply and have neither the interest nor (perhaps more importantly) the skills to practise integrated forest management. The government, therefore, should take on that responsibility and ensure that it collects enough revenue from the resource to carry it out.

The award of harvesting rights through tenure had two main goals — to encourage job-creating investments in manufacturing facilities through a secure wood supply, and to provide incentives for forest companies to carry out forest renewal programs. History has shown that while the employment and investment incentives worked very well, the forest renewal incentives were much less consistent.

The Tenure System Today

The evolution of tenure has shaped not just the way forest land is managed, but the structure of the industry that holds the tenures.

At present, some 85 per cent of the Allowable Annual Cut is allocated under long-term tenures and directly controlled by companies with wood processing facilities. By comparison, forest companies in other countries control on average less than 50 per cent of the harvest. In 1975, the largest single manufacturing company controlled 13 per cent of the Allowable Annual Cut. The largest now controls 17 per cent. In the same time period, control by the 20 largest manufacturing companies has increased from 74 per cent to 86 per cent of the committed AAC.

The Pressure for Change — The Need for Flexibility

The tenure system as described above has become very rigid. There is too much concentration of control over wood supply, and there is insufficient flexibility to accommodate society's changing values. Consider these pressures:

- Increasing world demand for wood fibre has had a dramatic impact on the level of activity in the forest.
- The demand for other values in the forest has grown.
- Access to wood by new users is restricted.

A New Tenure Philosophy — Goals and Principles

The Forest Resources Commission dealt with two fundamental questions — can a tenure system achieve the enhanced stewardship requirements of the future and, if so, on what basis should the tenures be allocated?

The Commission has concluded that selling off the province's public lands is not a realistic alternative.

Forest companies want secure tenures for strictly economic reasons. Investments in manufacturing facilities are expensive and risky. Without a secure, long-term supply of wood fibre, the risk is much higher and so, correspondingly, is the cost of financing the investment.

The Forest Resources Commission has concluded that the allocation of secure tenures to companies with manufacturing facilities is essential to both maintaining a competitive forest products industry and to developing a diversity of forest management practices. Nevertheless, the Commission believes that the present concentration of holdings of tenures is too narrow and limits the types of timber management practices, as well as the potential values for which the forests can be managed.

A bigger share of the Allowable Annual Cut should be allocated to smaller tenure holders who will manage the forests with emphasis on such values as community watersheds, range, wildlife, recreation and community forests. This allocation of the cut should be only to tenure holders without primary processing facilities. These allocations will be dedicated to the development of a province-wide log market.

The Commission is satisfied a more diversified tenure system coupled with a healthy, competitive provincial log market will not harm the competitive positions of B.C.'s forest products companies.

In essence, the Commission sees a tenure system that significantly reduces the volume of timber now controlled by a relatively small number of large corporations and transfers that freed-up volume to the development of a competitive log market.

The Forest Resources Commission recommends that:

44. there continue to be tenures granted that specify the rights, obligations and remedies of the tenure holder;

45. on the conversion of existing tenures, the amount of the Allowable Annual Cut held under tenure by companies with

manufacturing facilities be reduced to not more than 50 per cent of the lesser of either their processing capacity or their present cut allocation, and that the wood freed up be used to create a greater diversity of tenures;

46. **the Allowable Annual Cut freed up in (45) either be managed by the Forest Resources Corporation or reallocated to small area-based tenures managed by communities, Native Bands and woodlot operators, etc. These small tenures will be restricted to those who do not own or control processing facilities;**

47. **timber made available by the Forest Resources Corporation and other small, area-based tenure holders in (46) be used as the basis to develop a competitive log market in British Columbia.**

Tenure Reform — How it Will Work

This section spells out the Forest Resources Commission's recommendations for tenure reform.

Area and Volume-Based Tenures

Area-based tenures provide about 25 per cent of the Allowable Annual Cut, while volume-based tenures represent 75 per cent of the AAC. Which of these two basic forms of tenure is generally appropriate should rest on two fundamental factors — the biological resource capabilities of the land, as determined by the Land Use Plan, and the best opportunity for enhanced stewardship.

The recent history of forest management on these two types of tenure made it difficult for the Commission, initially, to make a definitive statement about them. The Forest Resources Commission has concluded that if enhanced stewardship for multiple values is a primary goal of tenure allocation under the Land Use Plan, the tenure must be area-based. The very nature of volume-based tenures, where the forest company has no long-term stake in a given area of forest, virtually assures a level of stewardship no higher than required by the term of the licence.

The decision over tenure types will be a regional consideration and will depend upon the forest history; the primary values that will be managed for on each forest unit (the Land Use Plan); and the suitability of the resource base to be included in a single management unit (i.e. distance to mills, community watersheds, wildlife habitat.)

Tenures related to woodlots, community forests, and Native Indian Bands are by their nature most suited to an area-based tenure. The volume of annual cut that is represented by these tenures should be increased.

The Forest Resources Corporation, to maintain its overall flexibility in forest management, should still manage some forest lands to provide wood on a volume-basis.

The Forest Resources Commission recommends that:

48. **wherever possible, tenures to which stewardship responsibilities are delegated be area-based;**

49. the Crown retain and manage, through the Forest Resources Corporation, sufficient forest lands from which wood will be available on a volume basis in order to retain forest management flexibility.

The Transition to Area-Based Tenures

A reduction in tenured wood supply volumes for manufacturing companies, and the creation of a log market with the resulting freed up volume may initially be seen by industry as an erosion of its competitive position. With that perception in mind, the Forest Resources Commission recognizes the need to significantly increase the level of security for all forest tenures, and solidify the levels of commitment on both sides of the tenure agreement.

The Forest Resources Commission believes that the most secure form of tenure agreement for both parties is a legally binding long-term contract — a Resource Management Agreement. Such contracts provide a full measure of security for management's investment decisions and for the government's stewardship requirements — with remedies available under contract law for failures by either signatory to perform to requirements.

Manufacturing facility owners who do not want to develop or manage an area-based tenure should have the option of signing a legal contract for wood supply. These Wood Supply Agreements would, in total, provide a volume commitment equal to what the forest product manufacturer would have been entitled to in an area-based tenure.

Since the new area and volume-based tenures will incorporate the values and objectives of the Land Use Plan, the Forest Resources Commission has concluded that rollovers of existing tenures into new, more secure Resource Management Agreements and Wood Supply Agreements should await land use designation.

The Forest Resources Commission recommends that:

50. present area-based tenures should be re-written and new area-based tenures should be issued in the form of a contractual Resource Management Agreement with appropriate rights, obligations and remedies to give greater security to the tenure holder and to the Crown;

51. a contractual Wood Supply Agreement should be developed by the Forest Resources Corporation also with appropriate rights, obligations and remedies for existing tenure holders that do not want to convert their volume-based licences to area-based tenures, or where local circumstances preclude the granting of an area-based tenure;

52. the rollovers into Resource Management Agreements and Wood Supply Agreements should await development of the first Land Use Plans. This will be two years in most cases.

Provision of Resource Management Agreements and Wood Supply Agreements

The Forest Resources Commission believes that tenures should provide the greatest security available short of outright private ownership. In return, however, the tenure holder must practise a level of enhanced stewardship that reflects the goals of the Land Use Plan. The performance should be audited and the audits monitored by a public review.

The biological and physical capabilities of the land and the range of other values being managed, as determined under the Land Use Plan, should be set out in the basic conditions of the tenure document. Management obligations and goals should be included in the contractual obligations of the tenure. Management and Working Plans should also contain contractual obligations that can be measured. Any penalties for non-performance, including the loss of tenure, should be clearly defined.

The public, as the owner of the resources, is entitled to know what management goals and obligations have been established, and whether or not those goals and obligations have been achieved. Independent audits will be subject to public review and should be performed at the tenure holder's expense. A direct relationship between performance and the retention of tenure will then be established. The Provincial Forester will have overall responsibility for these audits.

There will be a transition period as old volume-based tenures are replaced by Resource Management Agreements and Wood Supply Agreements. Existing area-based tenures (Tree Farm Licences) will be "grandfathered" in that their conversion to Resource Management Agreements will involve no reduction in area or volume. Sales or transfers of area-based tenures "grandfathered" under the new system will still be subject to surrendering to the government a 5 per cent share of the AAC as long as the tenured wood supply is still greater than 50 per cent of the AAC or 50 per cent of the mill capacity (whichever is lesser.) Once tenured wood supply falls below the 50 per cent level, the 5 per cent removal will no longer apply to sales or transfers. It is important to recognize that this "grandfathering" applies only to the tenure in excess of the 50 per cent level, and that represents only 3.75 per cent of the Allowable Annual Cut

Companies that do not want to manage an area-based tenure or where no suitable lands exist for an area-based tenure can arrange a contractual Wood Supply Agreement for a volume equal to what would have been available from the area-based tenure. Appropriate "evergreen" renewal provisions can be written in the Wood Supply Agreement.

At the end of the renewal period, companies will have no more than 50 per cent of their wood requirements under secure contractual Resource Management Agreements (or contractual Wood Supply Agreements) and purchase their remaining requirements on a competitive basis from the log market.

The Forest Resources Commission has concluded that the Resource Management Agreements should be for a term of 25 years, renewable every 10 years, based on management performance. There will be no volume reductions on sale or transfer of the Resource Management Agreement, and loss of tenure will occur only if the licence holder fails the management audit. Wood Supply Agreements should be for a term of 15 years, renewable every 5 years subject to satisfactory performance.

The tenure documents should also contain provisions for compensation for the removal of timber harvesting rights from land that is redesignated in the future to other uses.

In recommending compensation for a loss of contractual tenure rights, the Forest Resources Commission is implicitly recognizing the private cost of changes in social values.

The increased security of tenure provided by contractual agreements and the industry's ability to capture the results of increased investment will establish the appropriate conditions for enhanced stewardship.

The Forest Resources Commission recommends that:

53. **management goals and objectives derived from the Land Use Plan be included in the area-based Resource Management Agreements;**

54. **five-year Management and Working Plans reflect the management goals and objectives contained in the Resource Management Agreement and those contractual obligations that can be measured;**

55. **there be an obligation on the tenure holder to have performance verified by independent audit as specified by the Provincial Forester, and the results made public;**

56. **the management performance of the Forest Resources Corporation be subject to independent audit, and the results made public;**

57. **holders of area-based tenures that exceed 50 per cent of the lesser of either their manufacturing capacity or their harvesting quota be permitted to convert their Tree Farm Licences into the more secure area-based Resource Management Agreements with no loss of area. These tenures should still be subject to a 5 per cent reduction in volume when the tenure is either sold or transferred, until reduced to the 50 per cent level or lower;**

58. **tenure holders who have less than 50 per cent of the lesser of either their manufacturing capacity or their harvesting quota in area-based tenures be permitted to convert their existing licences to area-based Resource Management Agreement, subject to wood availability and the other conditions discussed in this chapter. These tenures should not be subject to the 5 per cent reduction in volume upon sale or transfer;**

59. **tenure holders who do not want to take on the management obligations connected with an area-based tenure, or where no suitable lands exist for an area-based tenure, be permitted to convert their existing tenures to a contractual "evergreen" Wood Supply Agreement equal to the lesser of 50 per cent of their existing manufacturing capacity or their total harvest quota;**

60. **existing tenures that are not converted to either an area-based Resource Management Agreement or a contractual Wood Supply Agreement be allowed to expire at the conclusion of their present term;**

61. **Resource Management Agreements be for a term of 25 years and renewable every 10 years, subject to satisfactory performance as determined through independent audit;**

62. **Wood Supply Agreements be for a term of 15 years and renewable every 5 years, subject to satisfactory performance as determined through independent audit;**

63. **penalties for non-performance, as measured by contractual standards and verified by independent audit, be detailed in the agreements, including conditions for loss of tenure;**

64. **the terms and conditions of compensation for redesignations of land out of the area-based tenure, changes in uses and changes to agreed management plans be detailed in the tenure contract. These terms and conditions should include compensation to all directly affected contractors, employees and/or other tenure holders;**

65. **the results of private investment in intensive silviculture and forest management, above the level of basic silviculture, not be subject to stumpage or other government charges on Resource Management Agreements, and be considered the property of the tenure holder;**

66. **the tenure holder be reimbursed by the government for costs incurred in managing for non-commercial renewable resource values where such management is a requirement;**

67. **the Forest Resources Corporation be reimbursed by the government for costs incurred in managing for non-commercial renewable resource values.**

Other Timber Harvesting Licences

There was strong support for other small, area-based tenures such as community forests and tenures managed by Native Bands. The Commission favors the gradual expansion of tenures such as these, as it believes they will lead to overall greater diversity in tenure holders. However, the Commission heard much dissatisfaction with category 1 and 2 small business sales, and believes they should be phased out.

The Commission heard repeatedly that the absence of a truly competitive log market killed many innovative value-added manufacturing proposals before they could get off the ground. This led the government to make some wood available through volume-based value-added sales. The Commission views this as a successful program that should be continued.

All of these new tenures should be tailored to the site and species in each region, and should be big enough to make them economically viable for their operators. The present size restrictions for woodlots (400 hectares) and regulatory requirements should be altered to reflect the legitimate requirements of the tenure holder.

The Commission believes that while regulations to ensure good forestry practices are necessary, the whole administrative requirement currently placed on woodlot operators should be reviewed and simplified.

Pulpwood Agreements have been used recently to provide fibre — usually from under-utilized species — for such ventures as particle board plants. This is not an appropriate use of Pulpwood Agreements and another form of tenure, such as a Wood Supply Agreement, should be used.

The Forest Resources Commission recommends that:

68. **category 1 and 2 of the small business program be phased out as the new tenure system is introduced. As wood then becomes available, it should be reallocated to small, non-processing area-based tenures managed by woodlot operators, communities, Native Bands, etc. or managed by the Forest Resources Corporation as is appropriate;**

69. **the volume-based allowable cut presently allocated under Section 16.1 of the Forest Act to the Small Business Forest Enterprise Program be converted to area-based Resource Management Agreements where possible;**

70. **area-based tenures that are not tied to manufacturing facilities should not be subject to size limitations but rather be determined on a site by site basis and be sufficient in area to be economically viable;**

71. **The administrative burden presently placed on woodlots be reviewed, altered and simplified to reflect the needs of the expanded small woodlot program;**

72. **no new Pulpwood Agreements be issued and existing agreements be allowed to expire at the termination of their contract period.**

Tenures for Range Lands

The Commission believes that, where practical, tenures for grazing should be area-based and managed through a Resource Management Agreement. The Resource Management Agreement will reflect the renewable resource values identified through the Land Use Plan, and provide for the integrated management of those values.

The Ministry of Crown Lands is currently responsible for grazing leases on leased Crown land and should retain that responsibility.

Just as the fruits of intensive forest management go to the tenure holder making the forestry investments, so too should the fruits of enhanced forage production go to the tenure holder making the range investments. Likewise, range tenures should have well-defined performance criteria written into the agreements and penalties for non-performance, up to and including loss of tenure.

The Commission sees no need to alter the current structure of range tenure, as there is already sufficient diversity among tenure holders.

The Forest Resources Commission recommends that:

73. area-based tenures for range lands reflect the same terms, conditions, rights and obligations as timber-based Resource Management Agreements, with whatever changes are necessary to recognize the structural differences between the forest and range industries. The Ministry of Crown Lands should continue to issue and record grazing leases.

Other Renewable Natural Resource Tenures

Several tenures, permits and licences available to resource users overlap timber harvesting tenures. Other tenure holders should have the same rights, obligations and remedies as those of timber harvesting tenure holders.

The Forest Resources Commission believes that timber harvesting tenures must respect other forest uses. Rights, obligations and remedies can be provided to other resource users on the same land through tenure agreements. This will yield a stratification of tenures and will strengthen all users' and tenure holders' rights.

The Commission has concluded that the government should review the variety of user permits on forest lands for their suitability for conversion to compatible area-based tenures.

The Forest Resources Commission recommends that:

74. the government review the variety of user permits and licences that are issued on Crown forest lands to determine the appropriateness of converting them to contractual area-based tenures.

Sale or Transfer of Renewable Resource Tenures

The Forest Resources Commission believes that the public should share equally in any "windfall" appreciation in the value of the tenure due to economic conditions. This could include, for example, real price increases in the value of standing timber due to scarcity or increased market demand. Half of any such 'non earned' asset appreciation should be returned to the Forest Resources Corporation on the sale or transfer of a tenure.

The Forest Resources Commission recommends that:

75. the Forest Resources Corporation receive a 50 per cent share of any windfall gains realized from the sale or transfer of timber harvesting tenures.

6. FINANCIAL AND ECONOMIC CONSIDERATIONS

Introduction

Assigning financial values to the forest resource and the multitude of activities that take place within it, is a daunting task. With that in mind, the Forest Resources Commission had several studies undertaken to produce the most reliable professional assessment possible of these values. Out of those studies, the Commission reached the following general conclusions:

- The forest industry is the most significant economic force in the province and will likely remain so for the foreseeable future. It should in no way be seen as a "sunset" industry. Its impact varies dramatically from community to community, ranging from minor in some to overwhelming in others.
- Although there is no generally accepted means of determining the value of the standing timber in the commercial forest, there are strong indications that it is probably significantly higher than is reflected by the stumpage paid to the provincial government.
- It is possible to weigh the effects of different forest management goals and techniques on all values in the forest.
- Values for non-industrial activities — recreation, wildlife, etc. — cannot be reliably quantified with existing information.

Income and Employment Impacts of the Forests

Estimates of the economic impact of the forests are heavily weighted towards commercial or industrial uses. The Forest Resources Commission determined that there was little to be gained by trying to provide an all encompassing value estimate for the forests in all uses. Instead, the Commission worked with the Planning and Statistics Division of the Ministry of Finance and Corporate Relations to develop an estimate of both the employment and Gross Domestic Product (GDP) contributions of the forestry sector to the province. As well, estimates were made of the importance of the forest sector to individual, representative towns in British Columbia.

In 1989, the forest sector's total (direct, indirect and induced) contribution to the provincial economy (GDP) was 16.9 per cent. On the same basis it contributed 14.4 per cent of total employment. This should not be confused with the often used phrase "the forest industry contributes 50 cents out of every dollar in B.C." This is derived from the fact that the forestry sector contributes 50 per cent of manufacturing shipments. However, manufacturing shipments are only one component of the GDP. The overall contribution of the forest sector to the provincial economy is significantly less.

The use of these numbers can produce another, perhaps more dangerous, set of faulty conclusions. For example, a 10 per cent reduction in logging and forestry activity would

produce a net effect of less than 2 per cent on the provincial GDP. But it would have a devastating impact on the small communities where the 10 per cent reduction actually takes place. It highlights the fact that there are two economies in British Columbia and they are split along urban/rural lines. The government developed estimates of the impact of local changes in forestry activity in several towns in British Columbia.

Employment Dependence on Forestry

Williams Lake	55.6%
Kitimat	22.5%
Castlegar	67.0%

The Forest Resources Commission also heard concerns about corporate concentration in the B.C. forest industry. While some individual forest companies are large compared to other corporations in the province, they are not large when compared to their international competitors.

The Commission has concluded that the wood processing industry must be allowed to evolve into whatever structure is needed to maintain its ability to compete in world markets. That may mean further amalgamations of wood processing facilities and a further concentration of existing processing facilities. Corporate concentration among tenure holdings, however, is a different matter. The Commission believes that its recommendations for the diversification of tenure holdings and the establishment of a viable provincial log market will ensure the maintenance of a diverse, competitive forest products industry.

Other Renewable Forest Resource Values — an Economic Point of View

As stated previously, applying the standard forms of economic analysis to the broad range of values society now recognizes in its forest land base does not produce a reliable estimate of their worth or their contribution to the provincial economy. However, this should in no way diminish their importance in land use planning and forest management, and in carrying out the Vision Statement's concept of enhanced stewardship.

Tourism, Ranching, Wildlife and Recreation Values

Tourism Canada estimates that tourism contributes 6 per cent of GDP in British Columbia. Recent analysis shows that forest-related tourism and recreation, such as adventure travel, fresh water sport fishing, wildlife viewing and hunting, are all growing activities. Ranching also provides a significant contribution to the overall economy of the province. However important all these activities may be, they are small when compared to the total economic impact of the forest sector.

An Asset-Based Approach to the Value of the Timber

The Forest Resources Commission asked consultants to examine alternative approaches to measuring the 'value' of the timber in the commercial forests. This asset-based approach used three indicators to determine the underlying value of the timber — provincial stumpage rates, private market log sales and sales of tenure.

In essence, the present stumpage return to government, using an industry rate of return on equity of 13.5 per cent, suggests a value of timber assets in British Columbia of $1.14 billion.

There are some market mechanisms in place that, imperfect as they are, at least provide an opportunity to make a market calculation on the value of standing timber. Using the values represented by these private transactions, the consultants produced a value of the asset base of between $4.7 billion and $8.8 billion.

Clearly, the asset base generated through private transactions is markedly higher than the asset base generated through provincial stumpage. This suggests that industry is capturing a much higher value from the forests than is the government. Stumpage payments are not capturing the full value of the resource. It is the view of the Forest Resources Commission that this 'gap' in valuation should be closed.

Management Options for a Forest Estate

A variety of management options exist that are both economically feasible and sustainable through time. To demonstrate the broad variety of management options possible and provide an example of the potential system of accounts, a 'pilot study' for a forest estate was prepared for the Forest Resources Commission. This study analyzed the impact of differing silviculture regimes, different utilization standards, extended rotation periods, and alternative harvesting methods. It put those variables together with management goals and objectives that vary among the full range of values.

What the study demonstrates clearly is that there are all kinds of options for society to consider, and selecting any one always has benefits and costs.

A System of Accounts for a Forest Estate

The pilot study conducted for the Forest Resources Commission on a forest estate established a system of accounts that could be used to 'track' management performance in a business plan format. The study established a format that would be useful in auditing 'tangible and measurable' results from stewardship activities.

A Province-wide Log Market

British Columbia's timber harvesting and wood processing industries were established upon a competitive log market. By the mid-1950s, it was clear that the number of small and large independent loggers was steadily declining. Years later the trend was still going

strong, and two things became clear: the competitive log market would ultimately disappear if the trend towards total integration were not stopped, and its usefulness in providing competitive stumpage price calculations was open to challenge.

The Commission believes that the establishment of a province-wide log market represents the only way that the province can realize full value for its resources, and generate the income required to fulfil the enhanced stewardship role of the Vision Statement.

Wood Fibre Exports

Log exports have been restricted in British Columbia since 1912 through legislation in the Forest Act. The absolute level of log exports in the province has historically remained low, particularly in comparison to exports from the U.S. Pacific Northwest States and Alaska.

The present restrictions on log exports go a long way towards ensuring domestic availability of logs while providing an 'outlet' for surplus logs. The development of a province-wide log market will substantially improve the prospects of exports being further reduced by a more efficient market distribution mechanism.

Provincial statistics on log exports are misleading, however. While log exports have represented a small proportion of the total provincial Allowable Annual Cut, they can represent a significant proportion of the cut in the area in which they are concentrated. The Commission believes it is in the long-term interest of British Columbia that as much wood as possible be processed within the province.

7. FOREST RESOURCE INVENTORY AND ALLOWABLE ANNUAL CUT

Inventory of Renewable Forest Resource Values

Sadly, the state of renewable forest resource inventories in this province is inconsistent at best, and woefully inadequate at worst. Planning must go ahead, and decisions must be made using the best information available. But the Commission believes that the current state of inventory information is a disgrace, given the importance of all renewable forest resources to the people of British Columbia.

The province's renewable forest resource inventories suffer from an uncoordinated approach by the several ministries and agencies, both federal and provincial.

Ten provincial ministries and at least two federal government departments maintain a wide variety of resource inventory data. There have been attempts in recent years to rectify the inconsistencies and inadequacies in this fragmented system and implement a more coordinated approach to inventory collection, but with only limited success.

An overall master plan is essential for the development of the inventories of renewable forest resource values. These inventories should be developed within a framework that ensures all data essential to forest resource planning is collected. The inventories must also satisfy the needs of resource user groups, and the public must have ready access to the information contained in them. The Forest Resources Commission has concluded that a Provincial Forest Resource Inventory Committee is needed to plan and guide this process. The Committee would report to the Minister of Crown Lands and would develop general objectives and standards and establish inventory priorities.

The Forest Resources Commission recommends that:

76. the Government of British Columbia undertake a commitment to complete inventories for all renewable forest resource values using standardized compatible systems;

77. a Provincial Forest Resource Inventory Committee be established to plan and develop a program for these inventories.

Timber Inventories

The importance of accurate and complete inventories of the trees growing on provincial lands, the different productive capacities of those lands, and the reliability of future growth forecasts cannot be overstated. As the industry moves from harvesting mature, natural forests to growing "second growth" managed forests, the reliability of inventory information becomes even more important. Adding to the importance of this information is the fact that changing social values are demanding more from the forests than commercial timber. To make intelligent choices, society must know what resources are there, and what the physical and biological capacities of the land are.

After reviewing several diverse timber inventories, the Forest Resources Commission

concluded that the provincial timber inventory is outdated and weak in several aspects. The current inventory cannot reliably estimate the volume of specific timber stands, nor can it provide dependable estimates of site quality and growth potential. As a result, planners and forest managers have limited confidence in the information they must use as a basis for planning and assuring enhanced stewardship.

A more accurate timber inventory must be completed province-wide over the next 10 years to give land use planners a reliable information base. Problem areas, and those areas under pressure already, should be given priority and completed within 5 years.

The Forest Resources Commission has concluded that a Timber Inventory Task Force, comprising a mix of public and private technical experts and inventory users, be formed to direct the development of the new inventory program. The task force will be responsible for setting technical standards and determining priorities for completion within a 10 year period. In general, the first priority for attention should be areas where overcutting is suspected. The task force should also complete a critical review of the current re-inventory program being conducted by the Ministry of Forests. This review must assess the technical merits of the re-inventory program and recommend what components to include in the new inventory. It should be completed within 12 months. This Timber Inventory Task Force would report to the Provincial Forest Resource Inventory Committee.

After reviewing inventory data, the Commission concluded that data on stand dynamics and growth rates is woefully inadequate. As a result, reliable computer projections about future timber yields in these forests cannot be generated. Users are unable to predict with confidence future harvest levels, and they can't reliably predict the impact on yield of various silvicultural treatments.

The Forest Resource Commission recommends that:

78. an updated provincial timber inventory, complying with new standards, be completed over the next 10 year period;

79. the timber inventory update must initially focus on problem areas, and complete them within the next 5 years;

80. a Timber Inventory Task Force, comprised of technical experts from private and public resource users, be established to design and plan the development of an accurate timber inventory;

81. the Timber Inventory Task Force should immediately conduct a critical review of the present Ministry of Forests Re-Inventory program, and report within the next 12 months;

82. the new inventory program must be designed and funded to provide reliable statistically sound data that can be used by local resource planning groups (and other resource interests);

83. the new provincial timber inventory should be structured on land management units with boundaries approximating the supply blocks within Forest Districts. The same boundaries should be used for the inventories of all renewable forest resource values;

84. a system for continuous updating of the provincial timber inventory must be established;

85. **a growth and yield program to quantify the growth rates of the second growth forests, for all commercial species in the province, must be established on a systematic, priority basis;**

86. **inventory designs vary to suit the objectives of the intended use.**

Allowable Annual Cut Determination

The Forest Resources Commission heard a great deal of concern that the provincial forests are being overcut — that the present level of harvest is not sustainable in the long run.

The current timber endowment consists largely of mature trees that have a greater volume of wood at harvest than will the "second growth" trees that replace them. Current timber management regimes and yield calculations are not designed to replace those current old growth inventories with an equal volume of wood. That means there could be a "falldown" of the inventory volume. This has led to a perception that B.C.'s forests are being overcut.

The real problem is that the information used to calculate these yield results is very unreliable. Yield analysis is often completed with an inconsistently defined estimate of the working forest area, outdated and unreliable inventory estimates of volume and production capacity, and growth and yield forecasts that do not reflect the actual growth rate of the forest. There can be only limited confidence in the yield analysis results. In other words, it is possible that the AAC determination is too high. It is equally possible that the AAC determination is too low.

The Forest Resources Commission recommends that:

87. **the Allowable Annual Cut of Timber Supply Areas or Tree Farm Licences not be raised or lowered until and unless new timber inventory data and subsequent yield analysis clearly justify an adjustment; except in those obvious cases where current information strongly support a change;**

88. **the Allowable Annual Cut for Timber Supply Areas and Tree Farm Licences be determined within the context of the forest management goals for all values on the management unit;**

89. **the yield analysis task be changed to become an integral part of the process of developing a forest management plan rather than used solely to determine Allowable Annual Cut;**

90. **Forest District Planning Committees be formed with the responsibility to prepare District Forest Management Plans. The representation must include technical specialists and the public;**

91. **the yield analysis task be decentralized and become the responsibility of the Forest District Planning Committee.**

8. FOREST PRACTICES

Introduction

The clash between the traditional economic values of resource development and the new, much broader values is most evident in public attitudes towards timber harvesting and other related forestry practices.

As the enhancement of all forest values through the practice of land use planning, renewable resource management, and tenure allocations all require a coordinated approach, so too, does the practice of determining timber harvesting techniques. An ecologically sound and socially responsive forestry is now required.

The Need for Established Practices

Much of the public's confusion over what is or isn't good forestry can be traced to the fact that there is no universal code of practice that covers all the aspects of harvesting and silviculture.

There is a need for a single code that governs all the elements of good forest management, such as:

- the choice of clearcutting or selection logging as a harvesting system within the silvicultural prescription.
- the size, distribution and timing of clear cuts.
- approaches to be taken during harvesting to consider a wide range of other values, such as water in community watersheds, estuaries, streams and lakes, wildlife habitat and migration corridors, areas of high visual or recreational value, special soils or soil cover areas, and slope instability.

The Forest Resources Commission has concluded that while many of these standards exist in different parts of different statutes, it would be valuable to amalgamate them in one code of practices. The general provisions of this code should recognize the need for site-specific determinations of actual procedures. A new, stand-alone Forest Practices Act is the appropriate mechanism for this amalgamation.

The Forest Resources Commission recommends that:

92. a single, all-encompassing code of forest practices be established through the introduction of a Forest Practices Act.

Biological Diversity

British Columbia has one of the most ecologically-diverse landscapes in the world. It includes greater ecological diversity than many areas that are significantly larger. Tree species diversity varies greatly from one part of the province to another. While coastal forests boast a large number of tree species, Interior central regions have fewer, and the areas of the northeast have fewer still. While B.C. has a lot of different ecosystems in

its different regions, the biodiversity of each ecosystem in itself is relatively low by world standards. While those statements are related to trees, the biodiversity of other plant, animal and insect life generally corresponds to the number of tree species.

The Tree Crop Production Cycle: Silvicultural Systems

To suggest that any particular harvesting system is all good, or all bad, fails to take into account many interdependent factors. Harvesting systems must be selected after consideration of all these factors and modified to take into account many other variables, including the non-commercial values society now feels are important.

Tree crops can be grown under one of two major types of silvicultural system: even-aged and uneven-aged. In an even-aged, managed forest there is a final harvest in which all or most of the trees are removed. Whether or not the new trees are planted, regenerate naturally, or are a combination of the two, they will all grow at approximately the same rate, and mature at about the same time. They are all harvested and the cycle starts all over again. In an uneven-aged managed forest, only the large, mature trees are harvested, leaving smaller trees to continue growing. Each system has its advantages and disadvantages, and each system is appropriate given the right circumstances. The Commission believes that substantial research, both in universities and in the field, must be undertaken to develop or refine appropriate silvicultural systems across British Columbia.

The Choice of System

If forest management is to be successful, the harvesting and silvicultural systems used must be fully integrated and ecologically sound.

The Forest Resources Commission has concluded that in most of B.C.'s commercial forests, silvicultural considerations alone will point to clearcut harvesting techniques on even-aged stands as the most ecologically sound.

Whichever harvesting and silvicultural system is used, forest management must reflect the physical condition and soils of the particular site, the ecological requirements of the forest plants that are to be grown, and the habitat requirements of a broad spectrum of animal and microbial species. These factors will determine the choice of harvesting system. If a clearcut system is chosen, it will also determine the size and dispersion of the cut. The clearcuts will be further modified by other, non-ecological factors such as aesthetic values. In addition, harvesting systems in forests that surround parks, wilderness areas, and ecological reserves should be given special site-specific attention.

The Forest Resources Commission recommends that:

93. timber harvesting should be conducted in an ecologically sound manner;

94. the choice of forest harvesting system reflect the physical and biological capabilities of the site, the requirements of the trees that are to be grown, as well as the impact upon other forest values through time;

95. if even-aged management is the silvicultural prescription, the

site and site condition should determine the size and dispersion of clearcuts. These, in turn, should be modified by the consideration of other non-ecological factors such as aesthetic values;

96. **the rate of harvesting must be designed to retain local and regional biodiversity throughout the rotation and reflect the management goals for all values.**

Forest Roads and the Environmental Impact of Harvesting

While much of the blame for environmental degradation in timber harvesting is placed on harvesting techniques, in fact many of the environmental problems are related to the access roads.

The major haul roads are generally well built and maintained. Unfortunately, secondary roads, spur roads, and other temporary roads have sometimes been poorly constructed, poorly located, poorly drained with inadequate culverts, poorly maintained, and poorly 'put to bed' for the period of several decades between their use for silvicultural or other management activities.

The Forest Resources Commission has concluded that in many cases, environmental damage is caused more by improper road construction and maintenance than by any particular harvesting technique. Therefore, increased emphasis should be given to long-reach cable systems or other systems that minimize the length of road required.

The choice of timber harvesting system in areas adjacent to sensitive wildlife or ecological systems should emphasize the shortest road system possible, and these roads should be reclaimed following harvesting and replanting.

The Forest Resources Commission recommends that:

97. **increased emphasis be given to harvesting systems that minimize the number and length of forest roads;**

98. **increased emphasis be given to other resource access management in planning forest roads;**

99. **where access provided by logging roads endangers environmentally-sensitive areas or wildlife habitats, these roads should be reclaimed.**

9. EDUCATION

Introduction

The key to the smooth operation of the new renewable resource management system, and the corresponding enhanced stewardship promised in the Vision Statement, is education. From the comments and questions of virtually everyone who appeared before the Commission, it is clear that much more must be done in the field of education.

Public School Curriculum

The Forest Resources Commission is pleased to note that the recommendation put forward in the Interim Report was immediately accepted and is being acted upon by the Ministry of Education. Efforts to develop a thorough and balanced public school forestry curriculum have been initiated and are ongoing. The Commission wishes to emphasize that the curriculum it envisages will lead to a balanced understanding of the economic, environmental, and social importance of all renewable resource values.

Public Information

An informed public is essential to the success of public participation. Both government and industry are currently operating a variety of public information programs designed to give average people a better understanding of the forest management issues society faces. These programs include conducted tours of mills, forest operations, and demonstration forests, as well as publication of brochures, pamphlets, etc.

In view of the increase in the level of public participation in land use planning and forest management, the Commission believes that both industry and government should expand these programs wherever possible.

The Forest Resources Commission recommends that:

100. public information and education programs conducted by all forest user groups be expanded wherever possible.

Certification of Forest Workers

The best system in the world is worthless without the skill and dedication of the men and women in the field who must, on a day-to-day basis, carry out the multi-faceted policies determined to be in the best public interest. Ultimately, success in achieving the goals of the Vision Statement will depend upon the skills, experience and understanding of those who work in the forests.

Thorough and intensive training must take place before workers are placed in the field. The Forest Resources Commission considered an option of proposing that all forest workers be required to undertake training in forest management and timber harvesting practices, as well as forest ecology. The program would lead to certification prior to their being allowed

to work in the forests. However, the Commission ultimately concluded that rather than impose yet another level of regulation on the forest industry, it should leave the responsibility for proper training and accreditation with the industry. Their management practices will be subject to audit, and failure to pass these performance audits could lead to loss of tenure. It will be in their own best interests to ensure that the security of their tenure is not jeopardized by improper practices or poor worker training.

The Forest Resources Commission recommends that:

101. government, in cooperation with industry and labor organizations, develop a voluntary training program for forest workers that will eventually lead to certification and become a standard for forestry employment.

Technical and Professional Education

Technical and professional graduates will need a much broader range of skills and knowledge than they are currently being given. Existing professionals will need to upgrade their skills.

The development of land capability information, new resource inventories, intensive silviculture and a better understanding of the inter-relationship of the various forest values under intensive, integrated resource management will require a new diversity of resource managers and resource management skills.

The Forest Resources Commission believes that as the emphasis is broadened on forest resource education at the public education level, so too, must it be broadened at the technical and professional level. Just as forest management must become multi-disciplinary in approach, the training programs for tomorrow's forest managers must be complementary and coordinated.

The Forest Resources Commission concluded that college and technical school resource management courses will need to be expanded to meet future demands, and must be broadened to reflect integrated resource management objectives and skill requirements. A high degree of cooperation and coordination between college and university programs should be encouraged. Expansion of the availability of transferable university credit forestry course work to more colleges and to second year course work should be a goal. The Forest Resources Commission believes that the training of mediators and the development of a conflict resolution process must be initiated.

The Forest Resources Commission believes that the integrated, intensive forest management envisioned in this report will require many more professional resource managers with a broader range of skills than we currently have, particularly in the Interior. In this vein, the Commission heard a good deal of support for a Forest Resources Management Faculty at the University of Northern British Columbia. The Forest Resources Commission believes that this new faculty could develop its own forestry degree program with its own forest management specialization.

The Forest Resources Commission recommends that:

102. the availability of university level credit courses in forestry be extended to more regional colleges and be expanded to include both first and second year level courses;

103. a Faculty of Forest Resource Management be established at the new University of Northern British Columbia;

104. the training of mediators and the development of a conflict resolution process be initiated;

105. the training of professional forest managers be expanded to include a broader range of skills, including more environmental training and training in public participation and conflict resolution techniques.

Research and Development

There is much more to be learned about the complex ecosystems of the forests. As our knowledge base grows, so does our ability to manage effectively the many resources and values the forests represent. The same can be said of the potential for developing new products or processing techniques to extract the most value from the wood that is ultimately harvested. That knowledge can come only from research and development. The Forest Resources Commission believes it is imperative that the continuing development of the graduate program of the Faculty of Forestry at U.B.C. as a centre of excellence must be supported.

The Forest Resources Commission believes that opportunities for expansion and diversification in specialty product manufacturing will grow. But they will need some help. Perhaps the most pressing problem faced by the small business manufacturing sector is a lack of information related to foreign market demands. The Commission believes the development of an up-to-date data base should be a priority.

The Forest Resources Commission recommends that:

106. continued support be given to the development of the Faculty of Forestry at U.B.C. as a centre of excellence in forestry;

107. major efforts be undertaken by governments and industry associations to expand the market and product specification information available to the developing secondary manufacturing industry in the wood products sector.

10. PUBLIC PARTICIPATION IN FOREST PLANNING AND MANAGEMENT

Introduction

People are becoming more interested in the issues that affect them and their society, and they want the kind of direct involvement that "town meeting" democracy once offered. The increasing complexity of society and the issues it deals with makes a complete return to simpler forms of democracy impossible. The challenge, therefore, is to devise a system of public participation that fits into the more complex, representative style of government now needed to run a complex society.

Nowhere is the demand for direct involvement more evident, nor the challenge more pronounced, than in forest management issues.

The Forest Resources Commission asked Simon Fraser University's Natural Resources Management Program and the University of British Columbia's Forest Economics and Policy Analysis Research Unit to study this issue.

In general, the Commission concluded that provisions for ensuring public participation must be formally enshrined in legislation. If the process is to work effectively, the public must be convinced that more than lip service is being paid to the concept of public participation. As well, they must be able to see for themselves, through an open process, that their participation is having an impact. It must be emphasized that public participation should occur at the appropriate times in the planning and management process — early enough to have an impact on decision making. It should not occur during the operational phase, when technical decisions are being made by professionals in the field.

Public participation is essential at the planning and management levels — not at the technical, or operational level — and is concentrated, therefore, around the land use planning process, the integrated management planning process, and the follow-up audits conducted to monitor performance.

The Forest Resources Commission recommends that:

108. all major areas where public participation is required in the planning and management of forest land based activities be enshrined in legislation.

Elements of an Effective Public Participation Process

From studies conducted for the Forest Resources Commission, the following are the principle components of an effective public participation program:

a. It must have a legal mandate

b. The process must be easy to understand

c. Those involved must be accountable

d. Public access must occur at key levels of the process

e. Provision must be made to notify interested parties

f. People must have access to information

g. Participants must have adequate resources

h. Written reasons for decisions are essential

i. There must be a conflict resolution mechanism

j. There must be an appeal process.

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FOREST RESOURCES COMMISSION

THE FUTURE OF OUR FORESTS

A.L. (Sandy) Peel, Chairman

APRIL 1991

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April 15, 1991

The Honourable Claude Richmond
Minister of Forests
Parliament Buildings
Victoria, B.C. V8V 1X4

Dear Mr. Richmond:

You asked the Forest Resources Commission to enquire into and provide you with advice on four specific matters respecting the forests of British Columbia. The Commission has completed its review of these matters in accordance with the Terms of Reference given to it and, herewith, respectfully submits its first full report.

Yours sincerely,

A. L. (Sandy) Peel
Chairman

Enclosure

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1. INTRODUCTION

A little less than two years ago, the British Columbia Forest Resources Commission was asked to examine the state of the province's forest land base and recommend improvements to the way it is managed.

It was a daunting task. The forests, the lakes, the rivers, the mountains — they are the heart and soul of the social and economic fabric of this province. Everyone in British Columbia has a stake in their welfare, and everyone is keenly interested in improving the way the activities that impact upon them are managed. Thousands talked to us — either directly in the many forums and public meetings held throughout the province, or in written submissions. All of us on the Commission are grateful for their contribution.

The messages they gave the Commission were as complex and varied as the people themselves, but one theme underlined virtually everything we heard — the status quo is not good enough. The way the forests and their many values are currently being managed by government and industry is out of step with what the public expects. It must change.

Driving the current level of dissatisfaction is a dramatic shift in society's values. Once valued only for their economic worth, the forest resources now represent a much wider range of values — aesthetic, environmental, social, spiritual, and many more. That shift in values underlies much of the conflict that has dominated the debate over forest resources in the last few years.

Very early in the exercise, the Commission recognized that any changes in the way the forests are managed to reflect a full range of values will depend on an all-encompassing vision of what we want from our forests, and what are acceptable practices to get us there. That Vision Statement is a simple statement of principle that has led to many recommendations for change.

The key phrase in the Vision Statement — and you will see it used again and again in the rest of this report — is **enhanced stewardship**. The Commission believes that the public's desire to see a full range of values reflected in our forests can be realized in one of two ways. Either large portions of forest land can be withdrawn from commercial exploitation to protect and preserve certain non-timber values, or it can all be managed more effectively to maintain or even improve the production of all values. We have concluded that the greatest benefit to all British Columbians will not come from significantly reducing commercial activity in our forests, with the resultant loss of jobs, negative community impact and reduced government revenue. Rather, it will come from managing our forests better for all values

Enhanced stewardship means recognizing that in addition to timber values, values such as cattle production, water quality, recreation, wildlife, wilderness, aesthetics should all be maximized through proper forest management. It means making choices about the relative importance of any one of those values with a full understanding of the impacts on the others, and in a way that not only preserves them, but enhances them. It means understanding the full range of economic and social costs and benefits associated with any decisions about resource management.

This shift from managing primarily for timber values to managing for all values requires significant change in how we plan, manage, and finance the activities that are carried out in our forests. The components and resulting recommendations outlined in the following chapters are like pieces in a jigsaw puzzle — they all come together to form one vision of enhanced stewardship. Leave some pieces out, and the vision is not complete.

British Columbians have an opportunity — a great opportunity — to grasp the vision of enhanced stewardship for our forests so that successive generations may benefit from and enjoy the full range of values that our forests can provide.

A. L. (Sandy) Peel

Chairman

2. VISION STATEMENT

The forests of British Columbia have become a focus of economic, environmental and social conflict.

Long taken for granted as the engine driving the economic growth of the province and providing financial and material benefits for us all — they have suddenly been overtaken by a dramatic shift in values. People now recognize a wide range of forest values that have little to do with economics or material wealth. Such things as pristine wilderness, environmental protection, water quality, recreation — and a host of others — are seen as equally important to economic security. Many feel those values should in fact take precedence over the traditional resource values that have served the province so well.

As with any significant shift in values, there is conflict. Those who defend the old values point, with a large body of evidence to support them, to the tremendous wealth created by resource extraction. They argue convincingly of the need to continue down that path, and speak confidently of our ability, through prudent forest renewal practices, to maintain that industrial capacity. Those who place new values ahead of the old argue, with equal conviction, of the need to halt the commercial exploitation of the forests, and to preserve what hasn't been liquidated before it is too late. They put environmental quality and preservation ahead of economics.

There is truth in both arguments. What has been lacking is any real effort on the part of society in general to discover if there is a formula for forest management that will reflect both points of view. Is there a way to chart a course that will recognize and encourage the new values while maintaining the benefits of the old? Hence the conflict.

The Forest Resources Commission believes there is a better way. After hearing the views of thousands of dedicated British Columbians, the Commission has developed a vision of the future that provides that formula. By embracing the ethic of ENHANCED STEWARDSHIP British Columbians can achieve the full potential of all values in our forests of the future. This means intensive, integrated management for all values on the largest forest land base possible. In this way:

the forests of British Columbia will provide for the economic, environmental, social, and spiritual well-being of all British Columbians through successive generations.

Acceptance of this vision requires change. We must now cooperatively manage our forests in a truly integrated fashion that considers all the values that society deems are important. Land use must be planned, and decisions on its use based on accurate and complete information about what it can biologically produce. Such comprehensive management requires a stable financial commitment. All points of view must have access to the process. Perhaps most important of all, people must be prepared to participate fully in the decision making process.

The forests of British Columbia are unique and have the potential to provide us all with lifestyles that reflect a tremendous range of values — perhaps even values as yet undiscovered. The vision outlined here, and detailed in the following sections of this report, will be a challenge for British Columbians. But the rewards of meeting that challenge are immense.

3. LAND USE PLANNING

1. A Blueprint for Diversity

The effective use of land and its resources has from the beginning of time shaped our progress and evolution. All societies — primitive or advanced — have had a vision of the land and based their social structure on that vision.

With that in mind, the Forest Resources Commission believes that any effort to protect and enhance the many values represented by British Columbia's land base must begin with a comprehensive Land Use Plan. From that plan, and fully integrated with it, will flow a variety of management systems designed to make the best use of all those values. This chapter will outline that plan and set the stage for the integrated use of the land and its resources.

Historically, Land Use Planning in British Columbia has been largely an economic concern. Those sectors of society that could promise economic benefits in the form of industrial development and jobs were usually given the right to extract whatever resources they required. While other values were considered from time to time, they all took a back seat to the primary call for timber, minerals, agricultural development, etc.

As a result, planning on Crown land was always based on a proposal for a specific use — such as timber harvesting. Government departments and agencies were structured to provide support — or advocacy — for these proposals. Thus the research and technical expertise became narrowly focussed to the specific use being proposed. Budgets were structured accordingly, and little consideration was given to integrating any other values into Land Use Planning.

The system has served the province well, providing the infrastructure for the growth of a wealthy, sophisticated society with well-endowed social programs and an enviable quality of life. Any values lost were, at the time, either unknown or not considered worthy of preservation. But two important factors have now combined to require a new, more integrated approach to Land Use Planning. Through a systematic awarding of resource rights over the last century, nearly all the provincial land base has been allocated to one or more forms of specific resource use. And social values have changed dramatically.

Recreation, wilderness, wildlife, water quality and quantity, aesthetics — those values and others have attained a much higher standing in the minds of British Columbians. The economic benefits offered by resource development are no longer the only important values in the forests — indeed, some argue that in many cases the economic benefits should take second, third or fourth place to those other values. Conflict and confrontation have become common in a clash of seemingly incompatible values. The current system of Land Use Planning, with its emphasis on the economic values, has tried to adapt to the new values and demands with only limited success. It is fundamentally ill-equipped to serve the increasingly complex demands of a public with differing values.

The Forest Resources Commission has concluded that a comprehensive Land Use Plan is required to accommodate that new, fuller range of values and to allow the introduction of additional values as society changes its outlook. The Land Use Plan will be a blueprint for managing this change.

The Commission has also concluded that the Land Use Plan must apply to the entire province. Many of the values that society derives from the provincial forests are also drawn from other Crown land bases (federal and provincial parks, Native lands, etc.) and from private lands. While there is no suggestion that these additional Crown lands and private lands be further regulated under the Land Use Plan, their contribution to society should be acknowledged and appreciated. Without their inclusion, the picture of values is incomplete.

Plans currently in place at municipal or regional district levels should be incorporated as is into the overall Land Use Plan. However, in no way will the Land Use Plan, or its administrative structure, usurp the existing legal jurisdictions of municipal or regional districts.

The structure of the Land Use Plan, and a schedule for efficient implementation, are detailed in subsequent sections of this chapter.

The Forest Resources Commission firmly believes that the Land Use Plan will provide the best opportunity for the people of British Columbia, through their elected government, to establish the goals and priorities essential for the protection and enhancement of all values associated with the land and the resources it holds. The plan provides a blueprint for managing all values across the full provincial landscape. It will also permit the full recognition of the gains and losses inherent in choices between different land use classifications and their individual management regimes.

The public has a role to play in the planning process at key points in the proposed Land Use Planning structure. All interested parties must have an opportunity to participate in Land Use Planning to ensure that multiple social values are considered. This overriding importance of this issue in defining values is explained in more detail in a subsequent chapter of this report.

The process envisaged for the Land Use Plan must be open, neutral, and balanced. High quality land stewardship is possible only if it is kept arms-length from the influence of short term economic or political aspirations. Current land use mechanisms are shared among several provincial government ministries (Forests, Environment, Parks, etc.) each with an advocacy position and with a profusion of overlapping jurisdictions and conflicting goals. For that reason, none of those ministries — Forests, Environment, Parks, etc. — is an acceptable administrator of a comprehensive Land Use Plan designed to reflect all values. Each brings a bias of one kind or another to the table. The Forest Resources Commission believes a restructured Ministry of Crown Lands, with a mandate to ensure the optimum balance of activities on all provincial Crown lands, should coordinate all Land Use Planning functions. It will be best equipped to ensure that the Land Use Plan functions as objectively as possible, with the best interests of all British Columbians in mind. The Commission believes that while

coordination of the Land Use Plan should be its primary function, the restructured Ministry of Crown Lands could retain its existing functions, including the issuing and recording of range leases and other specific leased activities (such as heli-skiing, etc.) Where appropriate, management protocols such as are currently in place between the Ministry of Crown Lands and the Ministry of Forests could be entered into with the new Forest Management structure recommended in this report. This should in no way impair the ministry's ability to carry out objectively its administrative responsibilities over the Land Use Plan.

This consolidation of jurisdiction will require significant legislative changes, both in the creation of a new act to empower the various components of the Land Use Plan under the Ministry of Crown Lands, and in amendments or deletions in existing legislation as it affects the multiplicity of planning functions now under the auspices of several other ministries. The Forest Resources Commission has concluded that a thorough review is required to identify whatever legislative amendments will be necessary to ensure that all government ministries are fully supportive of the new process and that their involvement is rationalized.

The Forest Resources Commission recommends that:

1. **the Government of British Columbia introduce comprehensive land use planning for the total land base of the province;**
2. **the government enact legislation giving a restructured Ministry of Crown Lands a broader mandate to ensure the optimum balance of activities on all Crown lands and to implement and administer the Land Use Plan;**
3. **the government review and amend the legislation of all ministries with responsibilities pertaining to the land base of the province to ensure both their involvement and support of comprehensive land use planning;**
4. **that public involvement be set out in legislation and cover all aspects of the planning process.**

2. Organization of the Planning Process

British Columbia has four of the five major climates in the world, 14 biogeoclimatic zones, and the largest number of distinct ecosystems in the country. More than half its 3.1 million people are clustered in the urban regions of Vancouver and Victoria, with the rest scattered in pockets over a landscape that covers nearly 100 million hectares. Any organizational structure designed to carry out an effective Land Use Plan in the province must take this geographic and demographic diversity into account. It must combine the broad goals and objectives of a centralized administration with the need for regional and local planning control. It must be capable of marrying what is in the broad provincial interest with what is in the regional and local interest.

To that end, the Forest Resources Commission has concluded that a multi-tiered process for creating and implementing the Land Use Plan is required.

A Land Use Commission will report to the Cabinet Committee on Sustainable Development through the Minister of Crown Lands. In conjunction with the Sustainable Development Committee, the Land Use Commission will assist in developing broad goals and objectives, provide a neutral forum for information, discussion and research on Land Use Plans, and make recommendations to government on the range of values to be considered in making land use decisions.

The Land Use Commission may want to establish a number of Regional Planning Groups throughout the province. While the Forest Resources Commission believes there may be a need for six to eight of these Regional Planning Groups, the actual number and make-up should be left for the Land Use Commission to determine. The Regional Planning Groups could act as a conduit for the cross-flow of provincial goals and objectives down to the local level as well as local concerns and issues up to the provincial level.

Detailed planning will be carried out by Local Planning Groups which report ultimately to the Land Use Commission. The Local Planning Groups, comprising professional resource staff as well as private interests and user groups, will develop the detailed plans for land use throughout the province, making assessments of values and priorities throughout. These Local Planning Groups are the core working groups of the whole process, and their importance cannot be overstated. They will provide the initial public input to the decision making process.

Land Use Commission

Government must establish the values that will be identified in the plan and set goals for the attainment of these values. The Land Use Commission will be able to assist the government in this process by determining land use capabilities and recommended targets for each of the values derived from the land base. These goals should reflect the varied ecosystems of the provincial biogeoclimatic zones. The legitimacy and integrity of each value that the land provides must be recognized in these goals.

The Forest Resources Commission believes that the Land Use Commission should have a limited number of appointments, and these should reflect a regional and sectoral balance. Land Use Commission staff should represent a range of resource professionals and planners that can assist the Commissioners in developing plans and in establishing an appropriate mechanism for mediation and dispute settlement. Only those land use proposals that cannot be resolved through the planning and appeal process, or that do not fall within established goals and land use classifications, should proceed to Cabinet for resolution.

Legislation establishing the Land Use Commission must also provide for an independent Appeal Board to settle disputes. While disputes over land use designations will be settled within the planning framework (as described later in this section), there is a need for a formal appeal process to settle disagreements between or among user groups within an approved plan. The Forest Resources Commission has concluded that an independent three-member Appeal Board is required to adjudicate operational

disputes among user groups with differing interests and values.

An initial step for the Land Use Commission should be to coordinate the development of provincial goals, taking into account the diversity of land and forest values. This will require an assessment of the capabilities of the differing provincial lands and forests, based on technical information generated through inventory research and economic research — which will be discussed in a later section of this chapter.

Regional Planning Groups

The Forest Resources Commission believes there may be a legitimate role for Regional Planning Groups, although a final determination should be left to the Land Use Commission. The Commission reviewed a variety of options for both the area coverage of the Regional Planning Groups and the representation within that group. The Commission sees the Regional Planning Groups taking a strong role in communicating between the Land Use Commission and the Local Planning Groups, in effect serving as the bridge linking the broad provincial goals and objectives on one hand with the local issues and concerns on the other. The regional plans will be open to public scrutiny and advice. Mediation of conflicts on site designations could be conducted by Regional Planning Groups.

The Forest Resources Commission considers between six and eight groups to be sufficient. There are six existing forest regions in the province and eight provincial development regions. However, the Forest Resources Commission believes that the determination of the appropriate number of Regional Planning Groups and their land base responsibility should be left up to the Land Use Commission to decide as it develops and reviews inventory information and the interactions of the land use classifications as they are developed and approved.

The Forest Resources Commission also believes that these planners and managers should be made accountable for their decisions by enabling legislation. Again, the Forest Resources Commission believes that the Land Use Commission should be responsible for defining the nature and responsibilities of these regional groups. The Regional Planning Group appointments should include, but not be limited to resource professionals, elected (community) representatives, and sectoral representatives or regional leaders.

Local Planning Groups

The Local Planning Group will be responsible for assessing the technical, biological, physical and economic attributes of the land base in order to determine its capabilities and value attributes. The classification determined for an individual site will be governed to a large extent by these factors.

The Commission believes that the Ministry of Forests' existing Forest Districts provide an appropriate land base for these Local Planning Groups. The sheer size of the task of developing information and assigning land use classifications requires the use of as much existing land base information as possible. The present district organizations

for forest resource planning and the most detailed inventories are to be found within the Ministry of Forests. This is a functional decision based on the current state of inventories and district boundaries, and could be changed as more complete information is developed.

Figure 1 ORGANIZATION CHART LAND USE PLANNING

CCSD through the Minister of Crown Lands
Land Use Commission sets goals and objectives
Disputes handled by Appeal Board
Regional Committees
Local Committees set Specific Land Use Plan

The Planning Process

The planning process will be acceptable to the public only if it is open, and is seen to be open. All levels of the planning process must use procedures that are well understood and justifiable. Reasons behind technical judgments and the information that was used to make decisions must be made available to all interested parties. Similarly, participants in the structured Land Use Planning Groups must all be actively involved in mediating disputes between stakeholders. The results of this process must clearly show the impact of the public consultations. (See chapter on public participation.)

Any conflicts unresolved by Local and Regional Planning Groups should go to the Land Use Commission for resolution. The Land Use Commission will determine the information that will be required to evaluate these conflicts and mediate and resolve them where possible.

Value trade-offs stemming from conflicts on specific sites should be made only in the context of established provincial goals and the broad land capabilities. At that time, the option of producing more of specific values on designated land bases through intensive management can be considered as a fully accountable choice between competing values in the context of overall provincial capabilities and goals.

Ultimately there will remain or develop irreconcilable disputes over specific land use classifications. It is recommended that the Land Use Commission be given legislated authority to make decisions on land use classifications for values and uses that fall within the provincial goals. This dispute settlement mechanism must be open to all, but efficient and timely in its decisions.

In order for the Land Use Plan to reflect multiple values, public input must be incorporated at key levels of the planning process. Public involvement will ensure that planning and management remain responsive to social change.

At the local level, the basis for land use designations will be a technical assessment of the capability of the land. Local expertise and information from resource users will be a necessary component of this assessment, including the development of inventories.

The Forest Resources Commission recommends that:

5. **a Land Use Commission be created by appropriate legislation and charged with implementing the land use planning process;**

6. **with the assistance of the Land Use Commission, the Province assess the capabilities of the land base to support particular values and then define its goals for various values within those constraints. The contribution of the various areas of the province to these goals should be refined at the local level;**

7. **the Land Use Commission report to the Cabinet Committee on Sustainable Development through a restructured Ministry of Crown Lands;**

8. **the Land Use Commission be given legislated authority to make recommendations to Cabinet on land use classifications for values and uses that fall within provincial goals. It should also develop a mediation and dispute settlement process;**

9. **with respect to areas of substantial land use classification conflict, it will be the responsibility of the Land Use Commission to determine the information that will be required to resolve these conflicts;**

10. **where resolution of specific Land Use Plan classifications cannot be mediated because of unresolved issues, the ultimate decision on use should await the completion of the province-wide Land Use Plan to determine compatibility with provincial goals;**

11. **only those land use proposals that cannot be resolved through the planning process, or that do not fall within established goals and land classifications should proceed to Cabinet for resolution;**

12. **legislation establishing a Land Use Commission should provide for an independently-appointed three-member Appeal Board to adjudicate disputes among users within approved plans, and to report its findings to the Commission;**

13. **the Land Use Commission be responsible for deciding whether or not Regional Planning Groups are needed and, if so, determine their make-up, area coverage and responsibilities;**

14. **the Local Resource Planning Groups use the existing Forest District boundaries as their initial planning basis.**

3. Technical Support

Professional Staff

To be effective, the Land Use Plan will require a large amount of technical support from professionals in a wide range of resource areas. Historically, that expertise has resided in individual ministries such as Forests, Environment, Parks, etc.

The initial planning and assessment process will draw heavily upon the professional and technical expertise that is available in government ministries. Therefore, the Forest Resources Commission has concluded that this expertise should form the core of the Local Resource Planning Group's multidisciplinary assessment team. Expertise available in user groups, as well as private individuals, should also be included in the team make-up. Their task will be to bring those resources that are necessary to bear on each land use classification decision.

The government's district staff have a working knowledge of the local resource capabilities. The use of their own ministry's information base will enhance the quality of the final decisions on classifications and greatly reduce the time required to complete the plan.

It is expected that these technical resource experts will draw heavily upon the experience and knowledge of individuals and communities that are familiar with the local land base and its historical uses and capabilities.

Inventories

The Forest Resources Commission, through an interim report, has already expressed its concern over the lack of inventory information that would be suitable for the analysis of land capability. The Forest Resources Commission is further concerned that the existing inventories vary in quality and detail in direct relationship to the economic value of the individual resource uses. The state of inventories and specific recommendations for dealing with them are the subject of a subsequent chapter in this report.

This economic approach to information development makes an objective assessment of a full range of values extremely difficult. While the approach to developing inventories is the subject of a separate section of this report, the Forest Resources Commission believes that it is necessary to make a comment here on both the funding and the accessibility of inventory data for Land Use Planning.

The Forest Resources Commission believes that financial priorities for the development of resource inventories should be determined by the ministry responsible for Land Use Planning — the restructured Ministry of Crown Lands. Funds would be allocated among the various resource ministries based on the need for basic information, rather than the economic value of the resource being inventoried. Furthermore, in conjunction with the recommendations concerning forest land management in subsequent sections of this report, it is recommended that the Ministry

of Crown Lands be responsible for dealing with requests from the public for inventory information on all Crown lands managed by the government.

In view of the substantial demands that will be made of the inventories to meet the goals and objectives of the Land Use Plan, the Commission has concluded that the resource boundaries for inventory development must be rationalized to provide compatible land base coverage. The Ministry of Crown Lands, as the ministry responsible for Land Use Planning, should be empowered to administer this task and make final determinations where there is disagreement among other ministries.

Evidence presented by a number of ministries, through the course of the Commission's deliberations, indicates that a centrally-developed inventory system could take up to 10 years to complete. While good inventory data is important, the government should not wait for it to be completed province-wide. Planning can start at the local level using existing information and local knowledge. The data base can be improved as the process is developed.

Land Use Classification

In its September 1990 Options Paper, the Forest Resources Commission presented a broad land use classification system for review and comment by the public. As well, the classification system was examined in a series of seven regional workshops.

The Commission has now incorporated the results of the workshop comments and public submissions into the following land use classifications. The Commission is aware that other classifications will need to be developed to suit land areas which lie outside of the provincial forests. The Commission feels that it can recommend, however, the following listing of land use classifications as having a strong consensus within the broad range of view points and interest groups that met with the Commission. Those under the protection/preservation category can have integrated uses, and should not be seen as necessarily exclusive. Equally, in the integrated use management areas category, intensive use of one or more values is possible. The classifications are, in alphabetical order:

Protection/Preservation

- archeological sites
- cultural and spiritual values
- ecological reserves
- flood or avalanche prevention
- parks
- special environmental features (sensitivity or instability)
- unique wildlife habitat
- wilderness areas
- wildlife migration corridors

Integrated Use Management Areas

- agriculture/range
- energy and mineral exploration
- estuaries, marsh lands
- fisheries & wildlife
- guide outfitting
- hunting
- special feature forests
- other resource extraction/harvesting
- recreation
- special purpose (research, heritage)
- timber production
- tourism
- trapping
- urban/forest interface
- views/landscapes
- watersheds (quality/quantity)

Areas of Restricted Use

- corridors
- destination resorts
- industrial sites
- mines, pipelines
- transit

In the protection/preservation and areas of restricted use categories, most of the major land use decisions have already been made. As planning proceeds and goals are established, these should be reviewed and re-considered in light of the comprehensive review of the total provincial landscape.

The Forest Resources Commission believes that the goals of the province will be best achieved through assigning the maximum amount of land to integrated use classifications. It is likely that the greatest potential for gains in all land and forest values by way of enhanced stewardship will come from the integrated use management areas category.

The timber production classification is presently managed for integrated use. But that's where most of the conflict and confrontation occurs, largely because of a perception that timber harvesting takes precedence even in an integrated use environment. Intensive forestry will be possible under certain classifications, and may

actually reduce the size of the land base needed to meet Allowable Annual Cut goals. While the management of forest resources is dealt with in another chapter, it is important to repeat here that the full range of forest values will be managed for on lands under the integrated use classifications. Forest harvesting plans must reflect the Land Use Plan and value designations. The key to maintaining Allowable Annual Cut goals within that framework lies in intensive forestry activities on those lands where timber production is identified through the planning process as the primary use. All management regimes within classifications will reflect biological and regional diversity objectives within the provincial goals.

The Forest Resources Commission recommends that:

15. **the Local Resource Planning Groups utilize the technical and professional expertise in existing resource ministries, as well as expertise available in private user groups and other individuals;**

16. **the budgets for the development of resource inventories be assigned to the Ministry of Crown Lands, for allocation on a priority basis among the various resource ministries;**

17. **the Ministry of Crown Lands be responsible for handling requests from the public for inventory information on all Crown lands;**

18. **the Ministry of Crown Lands take the lead in rationalizing the resource boundaries for land capability analysis to provide compatible land base coverage;**

19. **the technical land capability information that will lead to land use classifications be developed for the entire province;**

20. **the land use classifications that were developed in the Forest Resources Commission's workshops on the Options Paper form the basis for the classifications used in the Land Use Plan;**

21. **existing land use classifications for such areas as parks be reviewed in order to ascertain whether they are appropriate in view of the comprehensive review of the total provincial landscape.**

4. Implementation of the Land Use Plan

Much work needs to be done before the comprehensive Land Use Plan described in the previous sections will chart the future of land use in the province, and better reflect the changing values of society. As has already been mentioned, there are serious gaps in the inventories of major resource types and value assessments that must be completed, and the Commission recommends strongly that those gaps be systematically addressed.

But there is no need to delay government action. The basic plan can be implemented through legislative action and through the establishment of the various

planning mechanisms outlined. A combination of existing inventory information and local knowledge should be sufficient to develop plans if the goals and guidelines have been determined. The Land Use Plan is an integral part of the Forest Resource Commission's vision for the protection and enhancement of all values on the land base. It is the foundation on which further changes in the structure of integrated resource planning depend.

Once legislation has been passed and decisions have been made about the need for Regional Planning Groups, a two-year timetable is considered reasonable for the completion of district plans through the Local Planning Groups. The use of existing resource ministry expertise and inventories should be maximized, along with substantial input from interested resource user groups and local knowledge and information. The Forest Resources Commission believes that, in most cases, two years is sufficient time to develop a district Land Use Plan. It also believes that little will be gained, and much may be lost through further delays.

There are currently a number of resource planning initiatives under way. The Ministry of Parks is examining a range of proposals with a view to establishing more parks and ecological reserves. The Ministry of Forests is studying issues revolving around old growth timber and the need to preserve it. All these separate and seemingly uncoordinated activities are extremely confusing to the public. It would make more sense if the planning that is presently being undertaken by the government for parks, ecological reserves, wilderness areas, old-growth preserves, and other such initiatives be developed in conjunction with the overall Land Use Plans. These plans should be considered by the Land Use Commission as part of its overall planning responsibilities.

Finally, the existence of a Land Use Commission with a mandate to administer the planning function for the entire provincial land base calls into question the need for a separate, single function Agricultural Land Commission. The Forest Resources Commission believes that consideration should be given to absorbing the Agricultural Land Commission into the new Land Use Commission.

The Forest Resources Commission recommends that:

22. **a two-year timetable be established for completion of all district Land Use Plans;**

23. **the current planning for parks, ecological reserves, wilderness areas, old growth forest preserves and other similar planning activities be developed in conjunction with the overall Land Use Plan, and be considered by the Land Use Commission as part of its overall planning responsibilities;**

24. **consideration be given to absorbing the Agricultural Land Commission into the new Land Use Commission.**

4. A MANAGEMENT AND FINANCIAL STRUCTURE

"Management and finance of forest property belonging to the Province have both become intricate problems."

Report of Royal Commission on Forestry; 1910

1. A Framework for Enhanced Stewardship

From the beginning of commercial timber harvesting in British Columbia in the last century, successive governments and royal commissions have wrestled with the problem of designing an appropriate management system for the provincial forests. The goal was to provide for the long-term health of the forest while taking advantage of the short-term economic benefits it offers.

The problem is fairly simple: The growth cycle of a forest is measured not in years, but in decades and, ultimately, in centuries. Investments made now to nurture and enhance that forest won't bear fruit for another 80 to 100 years, or even longer in many cases. But the economic benefits of timber harvesting are immediate. The stumpage revenues along with corporate and personal income taxes flow in every year and are available instantly for schools, hospitals, roads — all the services we have come to take for granted. Sadly, it has been far too easy for all of us, as a society, to hold back on making those long-term investments in the health and sustainability of the forest and concentrate instead on the annual requirements for services. This tendency has been particularly hurtful during bad economic times, when the demands for social services rise at the same time the revenues from timber harvesting decline. The investments that should have been made every year in the provincial forests as a matter of course were inadequate. The result has been an erosion of the forest capital base.

We should have known better. Indeed, we did know better. British Columbia's first royal commission on forestry — the Fulton Commission — recognized in 1910 that the investments needed to ensure the long-term health and productivity of the province's forests must be shielded from the short-term demands of society. It saw the revenues from timber harvesting not as disposable income, but first and foremost as capital to be reinvested in the forest. The next royal commissions on forestry, headed by Chief Justice Gordon Sloan in 1945 and 1956, echoed the Fulton recommendations by saying that only those funds left over after the appropriate investments have been made in replenishing the forests should go into the province's general revenue accounts.

The advice was not heeded. To this day, expenditures on forest management flow back to the forests after the timber harvesting revenues have been processed through the province's general revenue accounts. The sole advocate for the long-term health of the forests — the Minister of Forests — must compete with other ministries, each with its own advocacy position, for the funds required to renew the forest. While much of

the responsibility for forest renewal on public lands has, in recent years, been placed on private companies through the requirements of various forest tenures, it has not made up for years of neglect. Uncertainty about the sanctity of contracts and tenure rights, unsettled Native land claims, and other issues — all have combined to discourage private companies and individuals from doing any more than the minimum required by law when it comes to forest management. In short, the system is inadequate to meet the growing range of demands on British Columbia's renewable natural resources.

In the past, the commercial values of the forest were the primary values to be considered. The reinvestment battles fought at Cabinet and Treasury Board by the Minister of Forests were aimed, for the most part, at perpetuating those commercial values. But as the Forest Resources Commission has outlined in the previous chapter on land use, society's values have changed. In the minds of many, other values have become at least equal to, and in many cases take precedence over, the traditional economic values of the forests. In addition, we are now at the point where all those values must be reflected on a forest land base that is already fully committed to one use or another.

That has created two important requirements that must now be addressed: We require an administrative structure that will allow the true integration of the full range of forest values as set out in the Land Use Plans. The structure must relate not only to the commercial forest lands of the province, but also to the non-commercial forests and range lands. We further require the means to secure stable, long-term funding that will guarantee the enhanced stewardship necessary to carry out the entire plan.

The Forest Resources Commission has concluded that the policy and regulatory functions in a number of ministries currently representing a wide range of forest values should be grouped under one new ministry — the Ministry of Renewable Natural Resources. Day-to-day administrative functions in these same areas should also be grouped under the new ministry — but separate from the policy and regulatory functions. In this way, the full range of values will be protected and enhanced under one ministerial responsibility, and the responsibilities of the expanded ministry will fit well within the overall Land Use Plan administered by the Ministry of Crown Lands. This expanded Ministry of Renewable Natural Resources will replace the Ministry of Forests.

Society's demands for recognition of a broader range of forest values will significantly increase the pressure on what has been the traditional commercial forest. The forest's contribution to the reflection of those values will require a firm and unassailable commitment to enhanced stewardship. As well, the commercial forest must be administered in a way that maximizes its economic potential.

The Forest Resources Commission has concluded that the province must come to grips, once and for all, with an adequate funding base for forest renewal and management. The direct revenue generated by timber harvesting must be captured and increased over time, and used to maintain and enhance the capital base of the province's forests. The Commission examined the history of special purpose funds set up to address this problem and concluded that they are too vulnerable — often drained

to pay for other government programs when a revenue shortfall is experienced. Other possible funding mechanisms were not suitable to the task.

The only legal entity with the broad powers needed for the job is a Crown Corporation — the Forest Resources Corporation. Established by legislation, it can collect revenue, borrow money when necessary, manage the forest and pay dividends to the government. Operating at arms length from the government and subject to legislated requirements for public participation (see Chapter 10), the Forest Resources Corporation will be able to finance the stewardship requirements of the province's forests. It will report to the Cabinet Committee on Sustainable Development through the Minister of Renewable Natural Resources.

The Forest Resources Commission recommends that:

25. **the Government of British Columbia establish a new Ministry of Renewable Natural Resources to replace the Ministry of Forests and take on an expanded role in the policy, regulation and general administration of the forest and range lands of the province;**

26. **a Forest Resources Corporation be established through legislation to finance and manage the public's commercial forest land base;**

27. **the Minister of Renewable Natural Resources be responsible for the Forest Resources Corporation.**

2. The Ministry of Renewable Natural Resources — Organization and Responsibilities.

In its review of the role of government in forest resource management, the Forest Resources Commission found that at least 13 government ministries had mandates or responsibilities flowing from or attributable to the forest land base. Integrated management becomes extremely difficult with such a widespread dispersal of authority.

While there are clear advantages to having Cabinet ministers who are "advocates" for parks, energy and mining, tourism, agriculture, and others; there is also a clear advantage to grouping some of the key resource values (forests, range, water, fish and wildlife) under one ministry — the Ministry of Renewable Natural Resources.

The Commission has concluded that those integrated use management areas (as defined by the Land Use Plan) with the potential for commercial timber production will be administered by the new Forest Resources Corporation. The Forest Resources Commission recognizes that the remaining Crown lands provide a spectacular array of other values such as park lands, watersheds, wilderness experiences, fish and wildlife habitat, and other diverse physical and biological values — all of which should be subject to integrated management.

Consideration was given to letting the Forest Resources Corporation manage these lands as well as its commercial forest. But the mandate of the corporation to

guarantee enhanced stewardship on its commercial lands, and provide financial stability at the same time, would not be consistent with any serious commitment to non-commercial activities.

Therefore, the Forest Resources Commission has concluded that the new Ministry of Renewable Natural Resources should be given the mandate to manage for these key resource values on those provincial forest lands that are not assigned to and managed by the Forest Resources Corporation.

While stressing the importance of individual ministries with "advocacy" roles, the Forest Resources Commission wants to ensure that their individual activities do not conflict with the principle of managing for multiple values within the forest land base. Therefore, it has concluded that a single act should be introduced that will coordinate the mandates of other ministries with responsibilities that impact on the forest and range land base, and formally enlist their support for the management of all values on all provincial lands.

The Ministry of Renewable Natural Resources should be assigned the mandate, staff and resources necessary for it to carry out its policy, regulatory and administrative functions. The new ministry should assume responsibility for the timber and range functions, currently in the Ministry of Forests, and for the water, fish and wildlife functions, currently in the Ministry of Environment. Three principal resource management divisions are proposed — one headed by an Assistant Deputy Minister (ADM) of Fish and Wildlife; a second by an ADM for Water Management; and the third, also at an ADM level, will be the Provincial Forester. Essentially, the new Ministry of Renewable Natural Resources will handle policy and regulatory functions and manage those lands for fish and wildlife, water, forest and range functions that are not under the jurisdiction of the Forest Resources Corporation. It will be up to the ministry to determine appropriate personnel assignments for its own administrative functions and those of the Forest Resources Corporation. It may well be that for some specialized services, such as silvicultural expertise, the ministry would second them on contract from the Forest Resources Corporation. The functions of the Forest Resources Corporation are detailed in the following section of this chapter.

The Fish and Wildlife Division will provide the government with advice on management practices and goals for these values under the Land Use Plan. It will manage these values on non-commercial forest lands and on other Crown lands. Fees for the use of resources such as hunting and fishing will be collected by this division from all areas of the province.

The Water Management Division will continue to be responsible for water supply management, water quality management, and flood and erosion control. These matters are inextricably linked to forest land management.

The Provincial Forester will take on an expanded role, a role seen as critically important by the Forest Resources Commission. The Provincial Forester position, currently known as the Chief Forester, was initially introduced in 1912 as a high-level advisor to the Chief Commissioner (Minister) of Lands and Forests on all matters of

forest management. The independence of the Chief Forester and the ethic that the Forest Service developed provided an important balance between the government, the industry and the public interest in forest management and conservation.

But over time, the Chief Forester's stewardship responsibilities have gradually been eroded to the point where the post is essentially a staff position with powers only to recommend. The vacuum ultimately created has led to many requests to the Forest Resources Commission for the establishment of an independent forest ombudsman. The Commission has concluded that in replacing the Chief Forester, the position and responsibilities of Provincial Forester should be structured so that the Provincial Forester is seen to be impartial, and to represent all values in forest management on all Crown lands.

Therefore, the Commission has concluded that the Provincial Forester should be required by legislation to make annual reports direct to the legislature on the state of the forests. In essence, the Provincial Forester must have a position that will be seen by all to be unbiased and trustworthy.

In order to ensure that the Provincial Forester can fulfill this role, the Provincial Forester's office should also be guaranteed access to all inventory information developed by the Forest Resources Corporation, as well as by other forest land base tenure holders, and be responsible, where required, for maintaining the quality of inventory information on all other Crown lands.

The Provincial Forester will be required to develop policies related to forest management and have final responsibility for the determination of the Allowable Annual Cut — the volume of timber harvested each year from the commercial forests. The Provincial Forester will also be responsible for integrated resource management, forest renewal, and other government responsibilities on lands not administered by the corporation. Staff related to recreational opportunities and developments on Crown lands will form part of the integrated resource management team reporting to the Provincial Forester. Finally, the responsibility for forest protection will be vested with the Provincial Forester.

The Forest Resources Commission recommends that:

28. **the Ministry of Renewable Natural Resources be made responsible for policies and regulations related to the key values of timber, water management, range, recreation, and fish and wildlife. The land base managed by the Ministry will be those lands not allocated to the Forest Resources Corporation;**

29. **the management for all forest values by government ministries be coordinated by a single act that ensures that the ministries' mandates are supportive of integrated resource management and enhanced stewardship;**

30. **there be Assistant Deputy Ministers respectively for fish and wildlife and for water management;**

31. **there be a Provincial Forester at an Assistant Deputy Minister level responsible for all forest-related matters other than fish and wildlife and water management;**

32. **the Provincial Forester assume responsibility for policy, research, regulatory staff from the Ministry of Forests, and the integrated resources and conservation staff of the Ministry of Environment;**

33. **the Provincial Forester be required to report annually direct to the legislature on the state of the forests.**

3. Financing Forest Resource Management: A Forest Resources Corporation

Concern was raised throughout the Commission's public meetings and in written submissions that the current level of timber harvesting is not sustainable, and that as a result, the present and potential values that could be drawn from the forests are being depleted. There was also a clear perception that the province's forests are being managed primarily for timber values.

The Forest Resources Commission believes the management of the forests requires a long-term commitment with a stable source of funding. The need for such a commitment today is more compelling than ever. The forests of British Columbia are now fully committed, and the demands on them to provide for the 'economic, environmental, social, and spiritual well-being of all British Columbians' will only increase.

The Land Use Plan outlined in the previous chapter provides a blueprint for land management goals based on a broad range of values, and it stresses the importance of accurate inventory information in achieving those goals. The creation of a new Ministry of Renewable Natural Resources provides the administrative framework in which those values can be protected and enhanced.

However, without the financial ability to provide the necessary level of enhanced stewardship through integrated resource management to meet those goals, the Land Use Planning proposals will have little value.

Since the beginning of the century, at least 14 "permanent" silviculture funds have been established and subsequently abandoned. The British Columbia Forest Resources Commission has concluded that past concerns regarding the need to shelter forest management from changes in political administrations and short-term budget cycles were well founded and have been borne out over time.

The Forest Resources Corporation recommended by this Commission represents the strongest mechanism available to secure stable, long-term funding for enhanced forest stewardship. Other funding mechanisms, including a financing authority and other administrative funds, were reviewed by the Commission, but all fell short of guaranteeing stable financing. As well, a corporation is the only vehicle that will allow debt financing in cyclical downturns.

The Corporation should be run by a Board of Directors with no more than 15 members representing all regions and sectors.

It is the view of the Commission that the direct revenues that are drawn from the forests must be used to manage, renew and replace the forests for future generations. The Forest Resources Corporation should be given the mandate of managing those commercial forest lands that are designated as integrated management areas under the Land Use Plan. The Corporation must be given the ability to charge for all the commercial consumptive uses of these lands and receive all direct commercial revenues from resources under its jurisdiction in order to be able to pay for their management and improvement. The Corporation should also be empowered by legislation to borrow against its asset base — represented by the value of the standing trees, not the land — in order to maintain continuous stewardship in times of economic down-turn.

The Forest Resources Commission has concluded that the new Corporation should be responsible for only those lands that have commercial potential and will be designated for integrated management that includes forest and range lands. The Commission believes that enormous opportunities are being lost to the Province through a lack of proper forest management. These opportunities include economic benefits that could be produced through intensively managing the forests to increase their timber yield, as well as to increase the broad variety of non-consumptive forest uses and values that enhanced stewardship could provide.

Other jurisdictions — such as Britain and the Scandinavian countries — have already demonstrated the gains that come from maintaining and nurturing their forests. They have also moved towards, or have already established some form of corporate model to administer and fund their forest management programs.

The Commission also believes that a Corporation operating according to sound financial principles should not allocate its resources to managing non-commercial forest lands, or for enhancing the non-commercial values of the lands under its jurisdiction. Undoubtedly the enhanced management of the commercial values of integrated management lands can and will improve other values such as recreation, hunting and fishing. But these values are part of the social and economic benefits that can be captured only by the province. The Commission has concluded that the cost of management for these non-commercial values should be recognized and be borne by the government out of general revenue — not out of the revenues of the Forest Resources Corporation. There are no more unallocated lands to offer to other values and uses in the forests; therefore, the costs of changes in values and management objectives must now be evaluated, and choices made. The management structure for these lands was outlined in the previous section.

The Forest Resources Commission has concluded that awarding secure rights to tenure holders for individual tracts of public land will provide the most efficient means of managing the resources. The security of tenure for resource users will ensure that they reap the benefits of the stewardship investments they make.

The Forest Resources Corporation should be empowered through legislation to enter into legally binding stewardship contracts with private companies or individual forest

resource managers. (The form of these contracts —Resource Management Agreements — is discussed in the chapter on Tenure.) Resource managers must be accountable for their management practices and must submit to independent audits to provide an objective assessment of their performance. The Forest Resources Corporation's management performance, too, must be assessed by an independent audit. Any commercial lands not covered by contractual agreements with private companies or individuals will be managed by the Forest Resources Corporation.

One of the principal objectives of the new corporation will be to raise sufficient funding for long-term management of the forests. The coordination of the various resource professionals now in the Ministries of Forests and Environment should reduce administrative costs and help attain that goal. Proper forest management and investment in stewardship will also provide, over time, greater returns to the corporation.

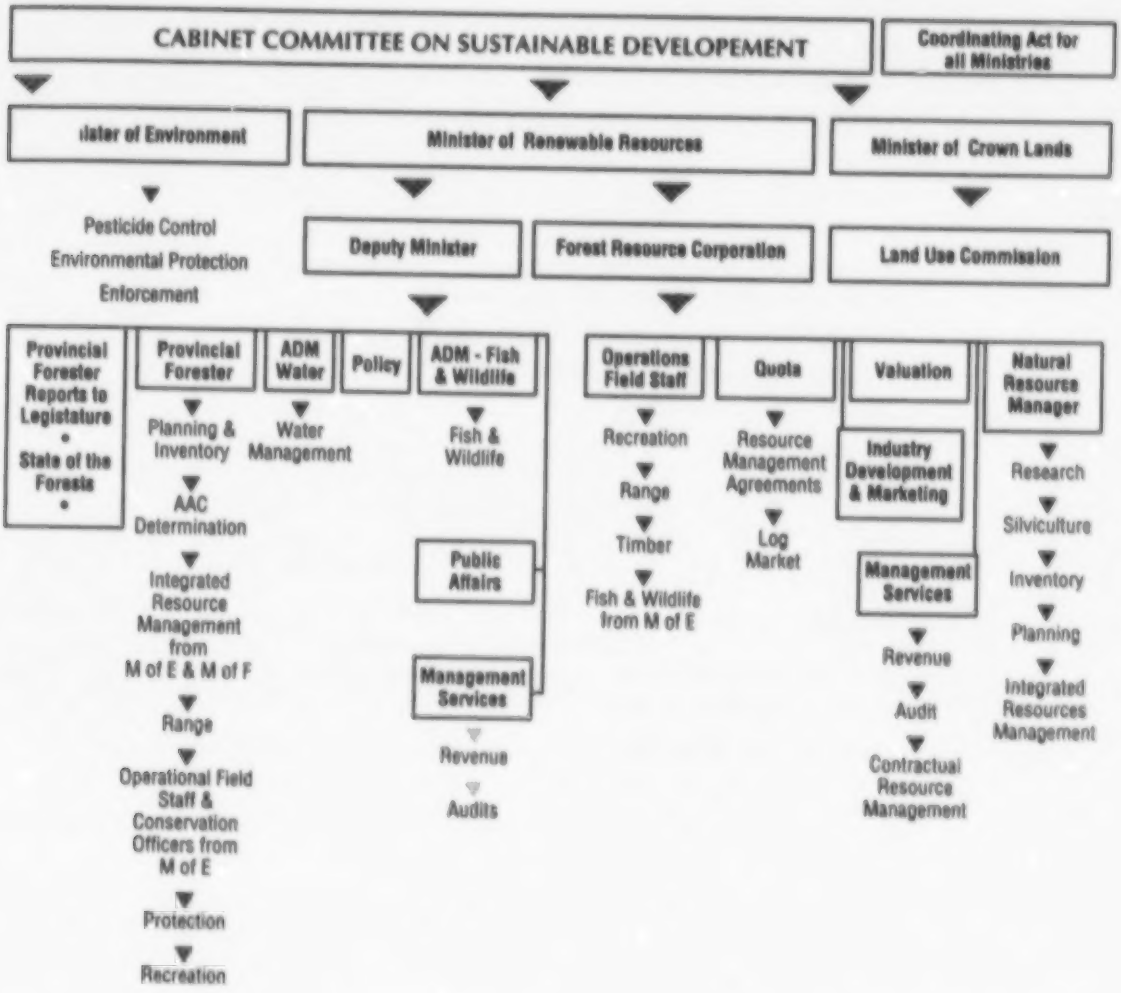
As a result of a dispute between Canada and the U.S. over allegations that timber stumpage constituted a subsidy, a U.S. countervailing duty of 15 per cent was about to be imposed on Canadian lumber imports in 1987. A Memorandum of Understanding between the two countries resulted instead in a 15 per cent Canadian surcharge on lumber exported to the U.S. The government of British Columbia has since increased its stumpage charges on timber harvested for all forest products, domestic and export. In light of that, and with the consent of the U.S., the 15 per cent surcharge on B.C. lumber exports was eliminated.

The Forest Resources Commission believes the province should now move away from administered stumpage prices towards a system of market prices determined through the development of a province-wide log market. A log market will encourage improved log handling and sorting practices in the woods and will ultimately provide better returns to the province for the wood harvested on provincial lands. Market-related efficiency gains will improve the cash flow to the Forest Resources Corporation, while allowing tenure holders to closely match their timber supply to their processing facility requirements. In essence, the province-wide log market will permit the efficient allocation of logs to their highest and best use. The province-wide log market is discussed further in the chapters on Tenure and Financial and Economic Considerations.

It is the belief of the Forest Resources Commission that the forests of British Columbia will provide sustainable economic benefits to the province only if provided with appropriate long-term management and financial stability. The Commission has therefore concluded that the Forest Resources Corporation should eventually be required to pay a dividend to government. However, that dividend must be calculated after all the financial requirements of enhanced stewardship are met.*

**For a complete discussion of the corporate structure proposed here, and what is in place in other forest jurisdictions around the world, please see: Managing British Columbia's Forest Resources: Structural Alternatives, Financial Considerations and Valuation Estimates, prepared by CWC Canadian Western Capital Ltd. and released as a supporting document to this report.*

Figure 2 PROPOSED MANAGEMENT STRUCTURE



It is important to recognize that stumpage in itself is a small part of the revenue that flows to governments from forest-related commercial activities. Corporate and personal income taxes, permit fees, rents, etc. — together contribute much more than stumpage.

The Forest Resources Commission recommends that the Forest Resources Corporation:

34. **be charged with the responsibility for such commercial Crown forest and range lands that are designated as Integrated Use Management Areas under the Land Use Plan;**

35. **have a representative Board of Directors of up to 15 members;**

36. **receive all direct commercial revenues from all resources under its jurisdiction;**

37. **be empowered with the ability to borrow against its assets as represented by the standing commercial timber under its jurisdiction;**

38. **be empowered to enter into legally-binding contracts, including stewardship contracts;**

39. **be empowered to undertake the management of non-commercial forest values and undertake socially desirable practices for the government in return for an annual appropriation that covers costs;**

40. **be empowered to pay a dividend to government;**

41. **be responsible for requiring independent audits of the performance of tenure holders for compliance with Resource Management Agreements, and for having such audits conducted on its own management performance;**

42. **assume the Operations Division, Valuation, Industry Development, Planning, and Silviculture Branches, and Inventory field staff of the Ministry of Forests, as well as most of the field staff of the Fish, Wildlife and Water Management Divisions of the Ministry of Environment;**

43. **as part of its mandate, establish a province-wide competitive log market.**

5. TENURE

FOREWORD:

The issue of tenure is difficult and complex. It is at the heart of forest stewardship as practised by the private sector, and is the underlying collateral for most of the investments made in wood product manufacturing facilities. In this chapter, the Forest Resources Commission recommends significant changes in the way all forest tenures are structured and managed. ***For that reason, the Commission believes the content and recommendations contained in this chapter should be published in the form of a white paper, to be discussed and analyzed over a period of time before being implemented.*** *The Commission further believes that regardless of the ultimate resolution of these tenure recommendations, no changes in tenure should be implemented until the first Land Use Plans have been approved — a process that is expected to take up to two years. This should provide ample time for dialogue.*

1. Resource Tenures — Introduction

Centuries ago, Europeans were attracted to this country by its vast physical resources — animals for furs, timbers for shipbuilding, and eventually land for farming and settlement. In the early days of development, no one could foresee a time when these seemingly inexhaustible resources would have to be carefully managed to ensure their perpetuation. Towards the end of the last century, it became clear that some form of control was needed for resource extraction — not necessarily for the practice of good stewardship but for the allocation of rights and privileges among a variety of competing interests.

While small (relatively speaking) pieces of property were sold to private concerns for such things as timber harvesting and other resource extraction, it wasn't feasible or desirable to carve out huge tracts of provincial land and sell them off to private owners. A system of tenures was developed to grant resource rights to private companies without giving them title to the land.

Over the last 50 years, this system of tenures has evolved to cover most of the forested land base in British Columbia, and is used to manage a variety of resources — from timber harvesting to fur trapping to range land for cattle ranching. The types of tenures and the length of time attached to them have become very complex and varied. In many instances, tenures granting rights for different resources (e.g. timber, cattle ranching) apply to the same piece of land and must be managed with that in mind.

Today, the forest land base is essentially fully committed to widely varied and overlapping user groups — all with one form of tenure or another. How those tenures are awarded and integrated is fundamental to the Vision Statement's concept of enhanced stewardship of public lands. There are no more vast stretches of untouched and unallocated landscapes just over the next hill, therefore it is crucial to manage the renewable resources on these lands as efficiently and wisely as possible.

2. The Role of Tenure and Timber Harvesting

While a number of resources in British Columbia are managed through tenure rights, timber harvesting is by far the most significant. The early allocation of forest land tenures in British Columbia was straightforward. The rights to harvest were sold to raise revenues. Reforestation was considered unnecessary in the context of millions of hectares of untouched forest, and no one gave much thought to other values and uses.

As more and more forested lands were logged, the provincial government recognized the need to improve forest management. It did this in two ways. On some areas of forest lands, the government delegated the stewardship responsibility to forest companies in the form of area-based tenures that are now called Tree Farm Licences. It should be noted that this delegation of the stewardship responsibility to private companies operating on public lands is virtually unique to Canada and particularly British Columbia. Originally these tenures granted the right to harvest in perpetuity in return for a commitment to maintain community stability and practise good forest management (Sloan Commission 1945.) These licences were altered through time to be "evergreen" or constantly renewable in nature (Sloan Commission 1956.) In principle, area-based licences were renewable provided that forest management commitments were honored. In practice, however, there were instances of TFLs being renewed even when the terms of the agreement were not honored. In effect, the company could harvest the trees in the TFL area as long as it complied with the maximum and minimum volume requirements. Some argue that TFLs give too much control to the large companies that hold them.

In other areas of the provincial forest, particularly in the Interior, the government retained the responsibility for managing the forest. On these lands called Timber Supply Areas, the government issued licences for forest companies to cut a certain volume of wood in areas designated by the Ministry of Forests. These volume-based tenures include forest licences, timber sale licences, timber licences and Pulpwood Agreements. The most significant difference between TSA and TFL tenures today is that in the TSA there is no long-term assurance that the licence holder will retain the right to cut successive tree crops on the same land base.

The two types of tenures represented different philosophies of forest management. In a TFL, the philosophy is based on an assumption that harvesting rights approaching those of private land ownership offer the best incentive to practise enhanced stewardship. It is further assumed that the licence holder, with sufficient incentive, will

do as good or better a job of integrated forest management as anyone else (i.e. the government.) Forest licences issued under a TSA follow the philosophy that "bottom line" motivated private companies are concerned, first and foremost, with timber supply and have neither the interest nor (perhaps more importantly) the skills to practise integrated forest management. The government, therefore, should take on that responsibility and ensure that it collects enough revenue from the resource to carry it out.

The award of harvesting rights through tenure had two main goals — to encourage job-creating investments in manufacturing facilities through a secure wood supply, and to provide incentives for forest companies to carry out forest renewal programs. History has shown that while the employment and investment incentives worked very well, the forest renewal incentives were much less consistent — some worked, and some didn't. Nevertheless, the system has generally worked to the economic and social benefit of all British Columbians.

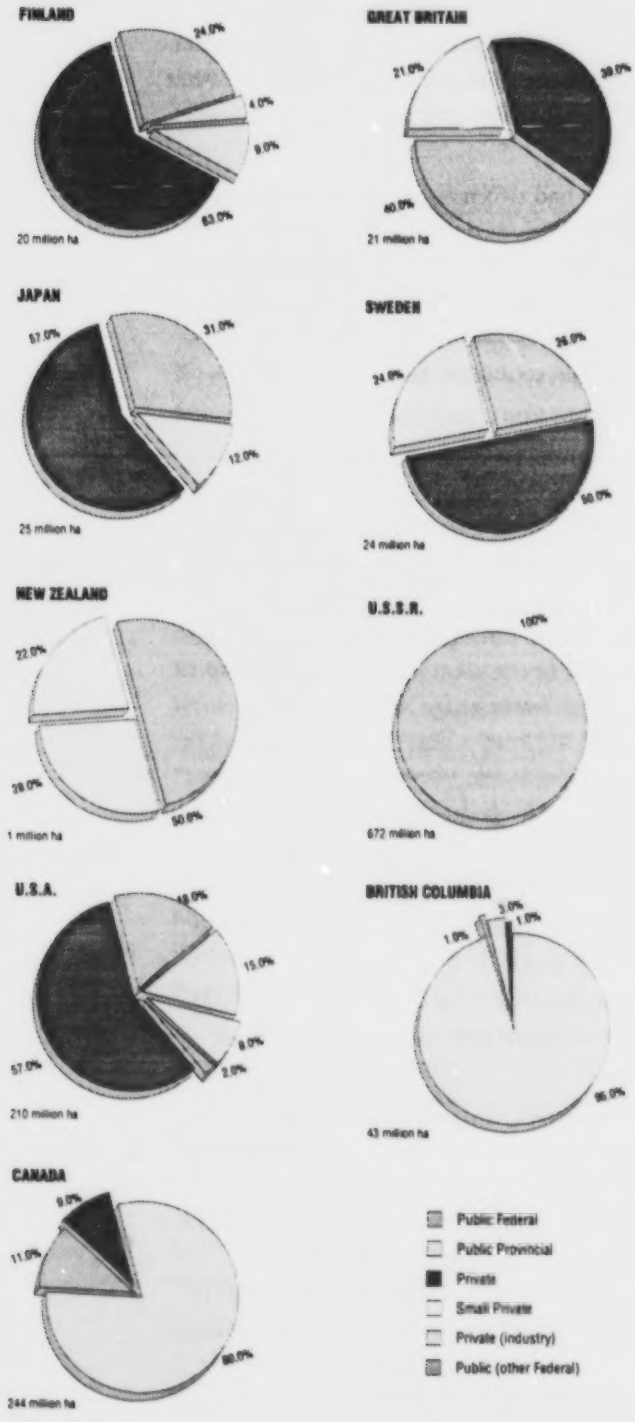
3. The Tenure System Today

Virtually all of the forested land is now covered by either an area-based Tree Farm Licence or one of a number of volume-based licences within a Timber Supply Area. There are 32 TFLs representing about 25 per cent of the Allowable Annual Cut and 35 Timber Supply Areas representing about 75 per cent of the AAC. The overwhelming emphasis of these tenures, understandably, is timber harvesting. As a result, the evolution of tenure has shaped not just the way forest land is managed, but the structure of the industry that holds the tenures.

Only the U.S.S.R. has a higher proportion of public ownership of forest lands than Canada. And in this country, British Columbia has retained the highest share of commercial forest lands in public ownership with 96 per cent, while three per cent is owned by the private forest industry and one per cent is held by small private owners. By comparison, 40 per cent of Britain's commercial forest lands are public and approximately 46 per cent are public in New Zealand. The United States, Finland and Sweden have between 23 per cent and 28 per cent of the forest lands in public ownership.

In British Columbia, some 85 per cent of the Allowable Annual Cut is allocated under long-term tenures and directly controlled by companies with wood-processing facilities. Another 15 per cent is managed and allocated under a variety of short-term licences to small businesses that are either logging companies or small business sawmills or secondary manufacturers. By comparison, forest companies in other countries control on average less than 50 per cent of the harvest. The private forest holdings in other countries are divided between the forest industries and other private land owners. The private forest industry controls 9 per cent of the commercial forest land base in Finland, 15 per cent in the U.S., 24 per cent in Sweden and 28 per cent in New Zealand. In Finland, Sweden and the United States, small private holdings of forest lands exceed

Figure 3 INTERNATIONAL FOREST LAND OWNERSHIP



50 per cent of the forest land base. The following Figures 3, 4 and 5 detail forest land ownership in major international forestry centres:

With such a large percentage of the B.C. wood supply coming from secure tenures, it is easy to understand why the tenures themselves have become a factor in industry's trend to improve efficiencies through amalgamation and concentration. In 1975, the largest single manufacturing company controlled 13 per cent of the Allowable Annual Cut. The largest now controls 17 per cent. In the same time period, control by the 20 largest manufacturing companies has increased from 74 per cent to 86 per cent of the committed AAC (See Figure 4). The issue of corporate concentration as it relates to tenure holdings is different from corporate concentration in manufacturing facilities. The degree of corporate concentration in tenure holdings raises greater concern than the degree of corporate concentration in manufacturing facilities. This issue is discussed in more detail in the following chapter on Financial and Economic Considerations.

4. The Pressure for Change — The Need for Flexibility

The tenure system as described above has become very rigid. There is too much concentration of control over wood supply and there is insufficient flexibility to accommodate society's changing values. Consider these pressures:

- Increasing world demand for wood fibre and improved harvesting and manufacturing technologies have had a

dramatic impact on the level of activity in the forest in the last few decades. Smaller trees can be harvested economically, different tree species have become more valuable, and poorer quality trees that at one time would have been left standing (or rotting on the ground) now have economic value. As well, rights to commercially-viable forests have been all but completely allocated in B.C.

- At the same time that demand for wood fibre approaches the supply, the demand for other values in the forest has grown. The value of the forest land is now much more than just the commercial value of the timber, and society is demanding that those other values be recognized and enhanced. The full range of renewable resource values and demands for their use can now be met only by managing intensively to provide more of all values. The public is insisting that the forests be managed for integrated use, not just for specific economic values such as timber.

- Access to wood by new users is restricted. The vast majority of wood is tied up under tenure by companies that primarily produce low value commodity products such as dimension lumber and market pulp. People with new ideas for wood products that would create more value and perhaps employ more people in their manufacture cannot pursue their ideas because they are denied access to timber.

Figure 4 CORPORATE CONTROL OF COMMITTED HARVESTING RIGHTS IN B.C.

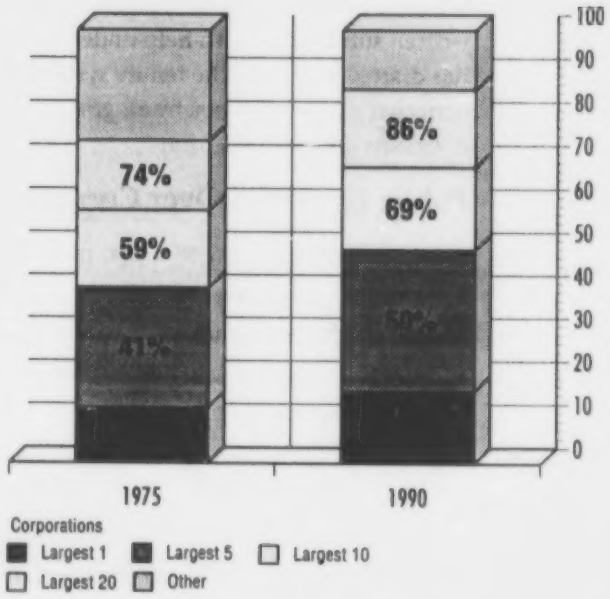
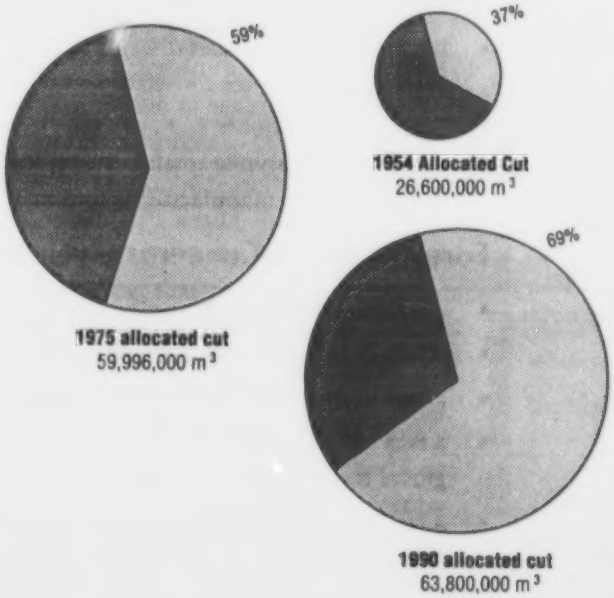


Figure 5 SHARE OF COMMITTED HARVESTING RIGHTS HELD BY THE 10 LARGEST COMPANIES



5. A Critique — The Public's and the Industry's View

The Forest Resources Commission heard criticisms of the tenure system from virtually everyone — whether they appeared at the many public meetings or made written submissions. To help understand the many recommendations the Commission has drafted to reform the tenure system, it would be useful to consider some of the concerns that were raised by all groups. It should come as no surprise that some of the criticisms are contradictory:

Public Concerns Over Current Tenures

- corporate concentration - too much timber in too few hands;
- a serious lack of competition for timber resources, and a resultant loss of potential government revenue;
- too much timber being wasted in the woods because major tenure holders have too much non-competitive wood available;
- a lack of adequate regulation and policing by the Forest Service, mainly due to re-organization and staff 'downsizing' in the early 1980s;
- a loss of jobs due to investments in high-tech processing technologies;
- a lack of expenditure and employment creation by major forest licensees in their forestry operations, particularly in forest management;
- disregard for community stability by major licensees in scheduling harvesting over large licence areas;
- environmentally insensitive logging practices due to a lack of adequate legislative and regulatory controls;
- no or insufficient consideration given to other resource uses and users in timber harvest planning and operation, with too much emphasis on timber harvesting;
- large, inflexible tenures disregard community watershed needs frequently due to insensitive 'absentee ownership' and lack of community interest;
- present timber quota commitments to 'established licensees' under the existing tenure system stymie small business initiative and innovation in new, value-added forest products manufacturing and marketing.

Forest Industry Concerns Over Current Tenures

- a lack of a long-term planning horizon;
- a lack of long-term security of timber supply;
- a lack of incentives for better forest management;
- a lack of security and hence financial clout to compete in the global forest products market;
- a lack of incentive to 'modernize' the manufacturing sector to remain competitive in the global market;

- the erosion of allocated timber harvesting rights and the loss of the timber land base to other users or uses;
- regulatory burden hindering or precluding the management performance and options of private enterprise;
- inadequate government funding for forestry work;
- too much interference in timber harvesting by other resource users.

6. A New Tenure Philosophy — Goals and Principles

The detailed study of existing tenures systems in British Columbia and the methods used in other jurisdictions raised two fundamental questions for the Forest Resources Commission to deal with — can a tenure system achieve the enhanced stewardship requirements of the future, and if so, on what basis should the tenures be allocated?

Clearly, any attempt by society as a whole to practice enhanced stewardship on the forest land base will succeed only if the management system — in this case tenure — works. Other jurisdictions rely much more on principles of private ownership and contractual relationships to guarantee enhanced stewardship and secure wood supplies (Figure 3). The Commission believes that the "self-interest" represented by these principles of private ownership should lead to better stewardship and a better representation of other values.

The Commission has concluded that selling off the province's public lands is not a realistic alternative. The challenge is to implement a system of tenures on those public lands that provides the highest level of enhanced stewardship through "self-interest," while retaining public ownership. The Commission believes that the structure it is recommending will accomplish that goal, but there are other factors that might work against it — the unresolved issue of Native land claims being perhaps the most significant. If this, or any other factor, interferes with practising an appropriate level of stewardship, the Crown may have no other alternative than to assume the responsibility itself and recover the full costs from the industry.

Forest companies want secure tenures for strictly economic reasons. Investments in manufacturing facilities are expensive and risky. Without a secure, long term supply of wood fibre, the risk is much higher, and so, correspondingly, is the cost of financing the investment. Financing costs in Canada are already higher than in many of the jurisdictions with which the B.C. forest products industry competes. As well, a lack of secure tenure makes any major investment in reforestation pointless. Why invest in something with no guarantee you'll reap the rewards? The history of forest renewal practices in British Columbia provides overwhelming evidence of the truth of these principles. The province of British Columbia, through legislation and regulations, has had to force tenure holders to reforest their harvested areas — and until very recently that reforestation was done almost entirely with public funds. There has been little or

no evidence of companies doing more than they are required by investing in silviculture. There is evidence of some companies doing significantly less. There has been no financial justification for private companies to do otherwise.

The Forest Resources Commission concluded that the allocation of secure tenures to companies with manufacturing facilities is essential to maintaining a competitive forest products industry and to developing a diversity of forest management practices. Nevertheless, the Commission believes that the present concentration of holdings of tenures is too narrow and limits the types of timber management practices, as well as the potential values for which the forests can be managed.

Those forest lands representing the current 15 per cent not allocated through existing large tenures would also benefit from more diverse holdings. A bigger share of the Allowable Annual Cut should be allocated to smaller tenure holders who will manage the forests with emphasis on such values as community watersheds, range, wildlife, recreation and community forests. This allocation of the cut should be only to tenure holders without processing facilities. These allocations will supplement the share of the Allowable Annual Cut that will be dedicated to the development of a province-wide log market.

The Commission is satisfied a more diversified tenure system coupled with a healthy, competitive provincial log market will not harm the competitive positions of B.C.'s forest products companies. There is ample precedent for just such an approach in virtually every jurisdiction with which the B.C. industry competes. A log market with a significant piece of the action will also ensure that log prices reflect the species and grades of logs and their value in production. The log market, in assuring that prices are maximized in keeping with the true market value of the resource, will also reduce waste in the woods and ensure that the most economic value is captured through manufacturing higher value-added products.

In essence, the Commission sees a tenure system that significantly reduces the volume of timber now controlled by a relatively small number of large corporations, and transfers that freed-up volume to the development of a competitive log market. At the same time, however, the remaining tenured wood supply will be more secure than it is now.

Detailed discussion of the recommendations flowing from these conclusions follows in subsequent sections of this chapter.

The Forest Resources Commission recommends that:

44. there continue to be tenures granted that specify the rights, obligations and remedies of the tenure holder;

45. on the conversion of existing tenures, the amount of the Allowable Annual Cut held under tenure by companies with manufacturing facilities be reduced to not more than 50 per cent of the lesser of either their processing capacity or their present cut allocation, and that the wood freed up be used to create a greater diversity of tenures;

46. **the Allowable Annual Cut freed up in (45) either be managed by the Forest Resources Corporation or reallocated to small area-based tenures managed by communities, Native Bands and woodlot operators, etc. These small tenures will be restricted to those who do not own or control processing facilities;**

47. **timber made available by the Forest Resources Corporation and other small, area-based tenure holders in (46) be used as the basis to develop a competitive log market in British Columbia.**

7. Tenure Reform — How it Will Work

As has been outlined in previous sections of this chapter, forest tenures in B.C. are varied and complex. They cover a variety of resource values and offer varying degrees of security with corresponding management responsibilities.

In the past, the main thrust of tenure agreements revolved around resource extraction. Other resource values were rarely considered. While attempts have been made in recent years to introduce the concepts of integrated resource management to the existing tenure framework, for the most part the results have been less than satisfactory. If tenures are to reflect society's changing values, they must be reformed. This section spells out the Forest Resource Commission's recommendations for tenure reform.

Area and Volume-Based Tenures

Area-based tenures (e.g. Tree Farm Licences) provide about 25 per cent of the Allowable Annual Cut, while volume-based tenures (within Timber Supply Areas) represent 75 per cent of the AAC. Which of these two basic forms of tenure is generally appropriate should rest on two fundamental factors — the biological resource capabilities of the land as determined by the Land Use Plan, and the best opportunity for enhanced stewardship.

The recent history of forest management on these two types of tenure made it difficult for the Commission, initially, to make a definitive statement about them. It was not originally foreseen, when the two types of tenures were implemented, that one would necessarily be superior to the other in terms of stewardship. A number of operational factors in the last decade or two complicated the Commission's attempt to make a determination in that regard.

- In the recession of the early 1980s the government practised 'sympathetic administration' to soften the impact of the economic downturn on mills and their employees. Harvesting rates and controls were relaxed to ensure that companies and communities survived the recession. The long-term health of the forest was compromised, and public confidence in both industry and government suffered.
- Prime timber areas within tenure agreements were re-designated to other uses. As a result, industry lost its confidence in the security of tenures. The loss in confidence

was compounded when the government reallocated, within its contract, five per cent of each tenure holder's annual volume to the Small Business Forest Enterprise Program.

- Budget cuts and staff reductions in the Forest Service during the early '80s also led to similar stewardship concerns about the government's ability to manage on Timber Supply Areas (TSAs) and to regulate forest management on Tree Farm Licences (TFLs.)

These problems made it impossible for the Commission to state a clear preference, based upon past performance, for either form of tenure. However, if enhanced stewardship for multiple values is a primary goal of tenure allocation under the Land Use Plan, the tenure must be area-based.

The Forest Resources Commission has concluded that area-based tenures, based upon long-term contractual commitments, will best achieve stewardship goals. The very nature of volume-based tenures, where the forest company has no long-term stake in a given area of forest, virtually assures a level of stewardship no higher than required by the term of the licence.

Over time, the number of area-based tenures should be increased. Forest areas should be evaluated for their capacity to provide all renewable resource values. Hence, decisions concerning individual tenures must await the development of a Land Use Plan and improved inventories for all renewable resource values.

Within that general principle the decision over tenure types will be a regional consideration and will depend upon the forest history, the primary values that will be managed for on each forest unit (the Land Use Plan), and the suitability of the resource base to be included in a single management unit (i.e. distance to mills, community watersheds, wildlife habitat.)

Tenures related to woodlots, community forests, and Native Indian Bands are by their nature most suited to an area-based tenure. The share of annual cut that is represented by these tenures should be increased. This is discussed further in a subsequent section of this chapter.

The Forest Resources Corporation, to maintain its overall flexibility in forest management, should still manage some forest lands to provide wood on a volume-basis. These lands will include areas not presently viable for timber harvesting, areas that do not fit easily within other area-based tenures, areas which permit timber harvesting under the Land Use Plan (but not as the primary management value), as well as problem stands, or areas requiring substantial management planning and expenditure for multiple uses or values. The Forest Resources Corporation will enjoy on its lands the same rights and privileges, as well as obligations and requirements, as the other area-based tenure holders.

The Forest Resources Commission recommends that:

48. wherever possible, tenures to which stewardship responsibilities are delegated be area-based;

49. the Crown retain and manage, through the Forest Resources Corporation, sufficient forest lands from which wood will be available on a volume basis in order to retain forest management flexibility.

The Transition to Area-Based Tenures

A reduction in tenured wood supply volumes for manufacturing companies, and the creation of a log market with the resulting freed up volume may initially be seen by industry as an erosion of its competitive position. With that perception in mind, the Forest Resources Commission recognizes the need to significantly increase the level of security for all forest tenures and solidify the levels of commitment on both sides of the tenure agreement.

The present area-based tenures (Tree Farm Licences, etc.) in British Columbia provide little security to companies with investments in manufacturing facilities and few incentives to practise intensive silviculture. The security for Forest Licence holders is even worse. Exacerbating the situation is the limited recourse available to all tenure holders for damages related to changes in policy or land-use decisions by the government.

On the other side of the bargain, the government has limited tools at its disposal to penalize poor performance by tenure holders. For example, Ministry of Forests officials have told the Commission that "the issue of performance, or lack of it, is decidedly not tied to the replacement process."

Because the overwhelming majority of wood fibre comes from tenured lands dedicated to specific companies and mills, penalties against a forest manager for poor forest practices could close down a mill, doing more damage to individual employees and the communities they live in than to the actual corporation being penalized. Governments would be extremely reluctant to take that kind of action. A significant wood volume made available through a log market would substantially remove this threat as market wood would still be available to the company.

The Forest Resources Commission believes that the most secure form of tenure agreement for both parties is a legally-binding long-term contract — a Resource Management Agreement. Such contracts provide a full measure of security for management's investment decisions and for the government's stewardship requirements — with remedies available under contract law for failures by either signatory to perform to requirements. The Forest Resources Commission has concluded that these agreements should be introduced for area-based tenures. The proposed terms and conditions for the contracts are reviewed in the following section.

Manufacturing facility owners who do not want to develop or manage an area-based tenure should have the option of signing a legal contract for wood supply. The Forest Resources Commission has concluded that contractual Wood Supply Agreements should be developed. These Wood Supply Agreements would in total provide a volume commitment equal to what the forest product manufacturer would have been entitled to in an area-based tenure. These two forms of contractual agreements are discussed in the following section.

The development of land-use classifications under the Land Use Plan should be completed in two years. Since the new area and volume-based tenures will incorporate the values and objectives of the Land Use Plan, the Forest Resources Commission has concluded that rollovers of existing tenures into new, more secure Resource Management Agreements and Wood Supply Agreements should await land-use designation.

The Forest Resources Commission recommends that:

50. present area-based tenures should be re-written and new area-based tenures should be issued in the form of a contractual Resource Management Agreement with appropriate rights, obligations and remedies to give greater security to the tenure holder and to the Crown;

51. a contractual Wood Supply Agreement should be developed by the Forest Resources Corporation also with appropriate rights, obligations and remedies for existing tenure holders that do not want to convert their volume-based licences to area-based tenures, or where local circumstances preclude the granting of an area-based tenure;

52. the rollovers into Resource Management Agreements and Wood Supply Agreements should await development of the first Land Use Plans. This will be two years in most cases.

Provision of Resource Management Agreements and Wood Supply Agreements

The Forest Resources Commission believes that tenures should provide the greatest security available short of outright private ownership. In return, however, the tenure holder must practise a level of enhanced stewardship that reflects the goals of the Land Use Plan. Performance should be audited, and the audits monitored by a public review. High quality management should be rewarded while poor management should be penalized.

The biological and physical capabilities of the land and the range of other values being managed, as determined under the Land Use Plan, must be set out in the basic conditions of the tenure document. The Forest Resources Commission believes that management obligations and goals must be included in the contractual obligations of the tenure. Management and Working Plans should also contain contractual

obligations that can be measured. Any penalties for non-performance, including the loss of tenure, should be clearly defined. By including specific, measurable goals within the Management and Working Plans, a system of accounts can be developed that will be open to audit.

The public, as the owner of the resources, is entitled to know what management goals and obligations have been established and whether or not those goals and obligations have been achieved. Independent audits will be subject to public review and should be performed at the tenure holder's expense. A direct relationship between performance and the retention of tenure will then be established. The Forest Resources Corporation should also commission independent audits on lands that it manages, and make those audits public. The Provincial Forester will have overall responsibility for these audits and will develop a list of private auditing companies capable of conducting forest management audits according to acceptable standards.

There will be a transition period as old volume-based tenures are replaced by Resource Management Agreements and Wood Supply Agreements. Existing area-based tenures (Tree Farm Licences) will be "grandfathered" in that their conversion to Resource Management Agreements will involve no reduction in area or volume. To protect existing volume-based tenure holders with investments in manufacturing facilities, the Forest Resources Commission is proposing they be guaranteed the lesser of either 100 per cent of their present harvesting quotas or 100 per cent of their present manufacturing capacity, subject to wood availability. The following conditions will apply:

- an area-based contractual Resource Management Agreement that will support 50 per cent of the lesser of either their present harvesting quotas or their present manufacturing capacity and;
- the right to make up the balance by retaining existing volume-based licences until the end of the next licence renewal period;

OR

- the right to convert existing volume-based licences to more secure contractual Wood Supply Agreements until the end of the next renewal period.

Present forest licence holders (with manufacturing facilities) who do not want to manage an area-based tenure can arrange a contractual Wood Supply Agreement for a volume equal to what would have been available from the area-based tenure. Appropriate "evergreen" renewal provisions can be written in the Wood Supply Agreement. Should there be insufficient forest lands suitable for area-based tenures, a combination of area-based Resource Management Agreements and Wood Supply Agreements with "evergreen" provisions will be allocated. It should be understood that any subsequent reductions in manufacturing capacity will result in a corresponding reduction in tenure.

At the end of existing licence terms, companies will have no more than 50 per cent of their wood requirements under secure contractual Resource Management Agreements

(or contractual Wood Supply Agreements) and will purchase their remaining requirements on a competitive basis from the log market.

Sales or transfers of existing TFLs "grandfathered" under the new system will still be subject to surrendering to the government a five per cent share of the AAC, as long as the tenured wood supply is still greater than 50 per cent of the AAC or 50 per cent of the mill capacity (whichever is lesser.) Once tenured wood supply falls below the 50 per cent level, the five per cent removal will no longer apply to sales or transfers.

The Forest Resources Commission recognizes that "grandfathering" existing area-based tenures, and not volume-based tenures, appears to give coastal producers (where most of the area-based tenures are located) an advantage over companies in the Interior, where most of the volume-based tenures are located. It is important to recognize that this "grandfathering" applies only to the tenure in excess of the 50 per cent level, and that it represents only 3.75 per cent of the committed Allowable Annual Cut.

The apparent inequity is offset, to a large extent, by the fact that Interior producers can convert a substantial portion of their volume-based tenures into more secure area-based Resource Management Agreements.

While this solution is not perfect, the Commission believes that the advantages outweigh the disadvantages. It recognizes the long history of forest stewardship carried out by some licence holders on existing area-based tenures. In no other way can a sufficient volume of wood be freed up to create a viable log market — one of the Commission's principal recommendations.

Existing volume-based tenures that are not converted to either area-based Resource Management Agreements or volume-based Wood Supply Agreements should continue in force until the term of the existing volume-based tenure expires. At that time, the cut will revert to the Forest Resources Corporation to be either managed directly or reallocated to smaller, area-based tenures not connected to processing facilities. This wood will then find its way into a growing log market that eventually could equal roughly one half of the provincial Allowable Annual Cut.

The terms for area-based tenures should be long enough to provide security for capital investments. However, the absolute length of the agreement is not as important as its renewability. For example, the present 'evergreen' clause in TFL agreements provides certainty that returns to investments can be realized. This feature should be retained in the new agreements, provided performance is proven.

The Forest Resources Commission has concluded that the Resource Management Agreements should be for a term of 25 years, renewable every 10 years, based on management performance. These terms should provide security, while allowing for negotiated changes to contractual conditions in an orderly and timely fashion. The 10-year renewal interval gives the tenure holder a 15-year supply of wood should the Resource Management Agreement not be renewed. There will be no volume reductions on sale or transfer of the Resource Management Agreement, except those above the 50 per cent level that have been grandfathered, and loss of tenure will occur

only if the licence holder fails the management audit. Wood Supply Agreements should be for a term of 15 years, renewable every 10 years, subject to management performance audits.

The tenure documents should also contain provisions for compensation for the removal of timber harvesting rights from land that is redesignated in the future to other uses. The compensation provisions should cover the tenure holder, all directly affected employees, contractors and/or other tenure holders for land within the area of the tenure that is redesignated under the Land Use Plan to uses that are incompatible with the continued exercise of the contractual rights.

In recommending compensation for a loss of contractual tenure rights, the Forest Resources Commission is implicitly recognizing the private cost of changes in social values. A new use or value of the land should, from a social point of view, provide greater net benefits than that of the previous use.

Remedies for losses suffered due to land redesignation should include an option to provide an equivalent and/or offsetting area-based tenure or Wood Supply Agreement if possible, or financial compensation established through market price valuations. These remedies should also be available to the Forest Resources Corporation for lands under its management.

To provide a better understanding of the contractual agreements discussed in this section, the Forest Resources Commission has drafted an example of the government lease to the Forest Resources Corporation and sample Resource Management Agreements. They are appended to this report.

The transition from existing tenure systems to the Commission's recommended system has been designed to avoid any sudden or dramatic changes in the fortunes of any of the many players involved. The gradual change at renewal period to a mix of area-based Resource Management Agreements and Wood Supply Agreements will provide increased security of tenure and wood supply for about 50 per cent of the Allowable Annual Cut, rather than the present 85 per cent. At the same time, the wood freed up will be used to establish a competitive log market.

The increased security of tenure provided by contractual agreements and the industry's ability to capture the results of increased investment will establish the appropriate conditions for enhanced stewardship. At present, there is little incentive for forest companies to invest in intensive forestry programs to increase the yield of wood from managed forests. They have no guarantee they will capture the fruits of those investments. The Commission believes that allowing both area-based and volume-based tenure holders to profit from the value of intensive forest management programs, including any earned increase in the volume of harvestable timber, will lead to a high level of enhanced stewardship. Even though the government will forego stumpage on the increased volume of timber, it is important to understand that the Crown still realizes through taxation the lion's share, about 75 per cent, of the increased value from intensive forest management activities.

Resource management requirements for each individual area-based tenure agreement must be tailored to suit the Land Use Plan. This could well mean capturing non-commercial values and incurring costs that neither the tenure holder nor the Forest Resources Corporation can effectively recover. The Forest Resources Commission has concluded that the costs of managing for the enhancement of such non-commercial values as wildlife habitat should be reimbursed by the provincial government. In this manner the private cost of managing for social values will be recognized.

Last but by no means least, the maintenance of access to public forest lands must be an integral part of the development of tenures and management plans. Only in special circumstances related to, for example, ecological sensitivity, safety or other special conditions that are noted in the Land Use Plan should public access be limited on public forest lands.

The Forest Resources Commission recommends that:

53. management goals and objectives derived from the Land Use Plan be included in the area-based Resource Management Agreements;

54. five-year Management and Working Plans reflect the management goals and objectives contained in the Resource Management Agreement and those contractual obligations that can be measured;

55. there be an obligation on the tenure holder to have performance verified by independent audit as specified by the Provincial Forester, and the results made public;

56. the management performance of the Forest Resources Corporation be subject to independent audit, and the results made public;

57. holders of area-based tenures that exceed 50 per cent of the lesser of either their manufacturing capacity or their harvesting quota be permitted to convert their Tree Farm Licences into the more secure area-based Resource Management Agreements with no loss of area. These tenures should still be subject to a five per cent reduction in volume when the tenure is either sold or transferred, until reduced to the 50 per cent level or lower;

58. tenure holders who have less than 50 per cent of the lesser of either their manufacturing capacity or their harvesting quota in area-based tenures be permitted to convert their existing licences to area-based Resource Management Agreements, subject to wood availability and the other conditions discussed in this chapter. These tenures should not be subject to the five per cent reduction in volume upon sale or transfer;

59. tenure holders who do not want to take on the management obligations connected with an area-based tenure, or where no suitable lands exist for an area-based tenure, be permitted to convert their existing tenures to a contractual

"evergreen" Wood Supply Agreement equal to the lesser of 50 per cent of their existing manufacturing capacity or their total harvest quota;

60. **existing tenures that are not converted to either an area-based Resource Management Agreement or a contractual Wood Supply Agreement be allowed to expire at the conclusion of their present term;**

61. **Resource Management Agreements be for a term of 25 years and renewable every 10 years, subject to satisfactory performance as determined through independent audit;**

62. **Wood Supply Agreements be for a term of 15 years and renewable every 5 years, subject to satisfactory performance as determined through independent audit;**

63. **penalties for non-performance, as measured by contractual standards and verified by independent audit, be detailed in the agreements, including conditions for loss of tenure;**

64. **the terms and conditions of compensation for redesignations of land out of the area-based tenure, changes in uses and changes to agreed management plans be detailed in the tenure contract. These terms and conditions should include compensation to all directly affected contractors, employees and/or other tenure holders;**

65. **the results of private investment in intensive silviculture and forest management, above the level of basic silviculture, not be subject to stumpage or other government charges on Resource Management Agreements, and be considered the property of the tenure holder;**

66. **the tenure holder be reimbursed by the government for costs incurred in managing for non-commercial renewable resource values where such management is a requirement;**

67. **the Forest Resources Corporation be reimbursed by the government for costs incurred in managing for non-commercial renewable resource values.**

Other Timber Harvesting Licences

Many who attended the Commission's public meetings, or filed written submissions, expressed support for the modification and expansion of the woodlot program. There was also strong support for other small, area-based tenures such as community forests and tenures managed by Native Bands. The Commission favours the gradual expansion of tenures such as these, as it believes they will lead to overall greater diversity in tenure holders.

On the other hand, there was wide-spread criticism of the impact of the competitive bid sales conducted under the original small business program. Stiff competition for the 'cut' allocated under categories 1 and 2 of the small business program led to poor harvesting practices, unsafe working conditions, and financial failure for many small

businesses. Large tenure holders, through surrogate bids, ended up with much of the wood because of their ability to bid high for the small volumes and swallow the extra cost. The independent small business sector, lacking secure tenure and economies of scale, couldn't hope to compete on such an uneven field.

The Commission heard repeatedly that the absence of a truly competitive log market killed many innovative value-added manufacturing proposals before they could get off the ground. The wood simply wasn't available at an economic price. This led the government to make some wood available through volume-based value-added sales. The Commission views this as a successful program that should be continued.

Security of wood supply to value-added manufacturers would be enhanced if the current volume-based tenures were converted to area-based tenures with appropriate renewal clauses. These tenures would match those of the area-based Resource Management Agreements and be subject to similar conditions.

All of these new tenures should be tailored to the site and species in each region, and should be big enough to make them economically viable for their operators. Wood lots should be matched, where possible, to grazing leases. The present size restrictions (400 hectares) and regulatory requirements should be altered to reflect the legitimate requirements of the tenure holder.

Woodlot operators presented evidence that the administrative requirements on these small area-based holdings are essentially no different from the requirements for large area-based Tree Farm Licences, and represent an excessive burden, given the nature of their operations. The Commission believes that while regulations to ensure good forestry practices are clearly necessary, the whole administrative requirement currently placed on woodlot operators should be reviewed and simplified.

Pulpwood Agreements were also brought to the Commission's attention as an area of concern. Pulpwood Agreements are designed to provide pulp and paper mills with backup security for fibre, if for some reason the sources of residual wood from sawmill operations dried up. The development of a viable log market will negate the need for this type of agreement. More recently, Pulpwood Agreements have been used to provide fibre — usually from under-utilized species — for such ventures as particle board plants. This is not an appropriate use of Pulpwood Agreements and another form of tenure, such as a Wood Supply Agreement, should be used.

Accordingly, the Commission has concluded that the practice of issuing Pulpwood Agreements should cease and existing agreements be allowed to expire at the end of their contract period.

The Forest Resources Commission recommends that:

68. category 1 and 2 of the small business program be phased out as the new tenure system is introduced. As wood then becomes available, it should be reallocated to small, non-processing area-based tenures managed by woodlot operators, communities, Native Bands, etc. or managed by the Forest Resources Corporation as is appropriate;

69. **the volume-based allowable cut presently allocated under Section 16.1 of the Forest Act to the Small Business Forest Enterprise Program be converted to area-based Resource Management Agreements where possible;**

70. **area-based tenures that are not tied to manufacturing facilities should not be subject to size limitations but rather be determined on a site-by-site basis and be sufficient in area to be economically viable;**

71. **the administrative burden presently placed on woodlots be reviewed, altered and simplified to reflect the needs of the expanded small woodlot program;.**

72. **no new Pulpwood Agreements be issued and existing agreements be allowed to expire at the termination of their contract period.**

Tenures for Range Lands

While they frequently share parts of the same land base, the forest industry and the cattle industry have entirely different structures. While timber harvesting involves a renewable resource that takes several decades to regenerate, cattle ranching involves forage production that regenerates every year.

Grazing on range land represents a significant economic benefit to many communities in the B.C. Interior, from the Kootenays in the southeast up through the Okanagan, the Cariboo, and into many northern areas. More than 75 per cent of the range lands are forested areas, which means grazing takes place as part of an integrated resource use with timber harvesting, among others.

Range forage production, like forest renewal, responds well to enhanced stewardship techniques such as re-seeding, fertilizing, weed control, fencing and stock water development. The economic feasibility of further range development is limited, however, by site type and geography.

Where practical, tenures for grazing should be area-based and managed through a Resource Management Agreement. The Resource Management Agreement will reflect the renewable resource values identified through the Land Use Plan and provide for the integrated management of those values. However, there may be specific sites where an area-based tenure is not practical. A range area that is shared by several range users should offer a choice between:

1. An area-based tenure (Resource Management Agreement) that is shared jointly by the various range users.
2. A Forage Supply Agreement held by each range user. This agreement would be the same as a grazing licence or contractual permit administered by the Forest Resources Corporation (in place of the existing Forest Service.) The Corporation would retain responsibility for management and stewardship of these areas and act as a liaison among all users.

The area-based tenure, or Resource Management Agreement, held jointly by several range users must provide a method of conflict resolution. Conflicts between holders of Resource Management Agreements should be settled according to the provisions for dispute settlement outlined in the Land Use Plan.

Coordination of access for other users must be accounted for in maps and plans outlining the management plans. The efficient management of grazing livestock, and the safety of other users demands a coordinated approach. Cattle and people often don't mix well, and conflicts can be avoided by proper management.

The Ministry of Crown Lands is currently responsible for administering grazing leases on leased Crown land and should retain that responsibility. Management responsibilities are carried out by the Ministry of Forests under the terms of an Interministry protocol agreement.

Just as the fruits of intensive forest management go to the tenure holder making the forestry investments, so too, should the fruits of enhanced forage production go to the tenure holder making the range investments. Likewise, range tenures should have well defined performance criteria written into the agreements and penalties for non-performance, up to and including loss of tenure.

Charges for grazing rights should be based on a basic land rent, plus a formula which varies with the price of the product — the market animal. The price must recognize there is no comparable private range available, and cannot be fairly compared, therefore, to prices for grazing on private land. Operational costs on Crown range are substantially higher than they are on private grazing land, and the quality of forage on Crown range is generally lower.

The Commission sees no need to alter the current structure of range tenure, as there is already sufficient diversity among tenure holders.

The Forest Resources Commission recommends that:

73. area-based tenures for range lands reflect the same terms, conditions, rights and obligations as timber-based Resource Management Agreements, with whatever changes are necessary to recognize the structural differences between the forest and range industries. The Ministry of Crown Lands should continue to issue and record grazing leases.

Other Renewable Natural Resource Tenures

A variety of tenures, permits and licences available to resource users overlap timber harvesting tenures. These include, among others, hunting, guiding and trapping licences, grazing permits, water licences, and energy and mineral exploration and development permits.

The Forest Resources Commission has proposed a general increase in area-based timber harvesting tenures in order to provide increased security and promote enhanced

stewardship. Other forest resource users and values must have equitable treatment in forest management decisions. Other tenure holders should have the same rights, obligations and remedies as those of timber harvesting tenure holders. In essence, they should have similar recourse to remedies in the event of damages to their tenured rights.

The Forest Resources Commission believes that timber harvesting tenures must respect other forest uses. Rights, obligations and remedies can be provided to other resource users on the same land through tenure agreements. This will yield a stratification of tenures and will strengthen all users' and tenure holders' rights. One cannot preclude the other without consultation and/or compensation. All tenures must reflect the Land Use Plan for the area.

The Commission has concluded that the government should review the variety of user permits on forest lands for their suitability for conversion to compatible area-based tenures.

Without reducing the generality of the foregoing, the above conclusion should not eliminate the opportunity for a forest manager to utilize temporary tenures where they will serve operational needs.

The Forest Resources Commission recommends that:

74. the government review the variety of user permits and licences that are issued on Crown forest lands to determine the appropriateness of converting them to contractual area-based tenures.

Sale or Transfer of Renewable Resource Tenures

As demand for timber has increased in the province, and as companies have attempted to consolidate and secure their log supplies, the value of tenures has increased. At present, all tenures sold must return to the Crown 5 per cent of the Allowable Annual Cut. This volume is used to support the expansion of the small business program.

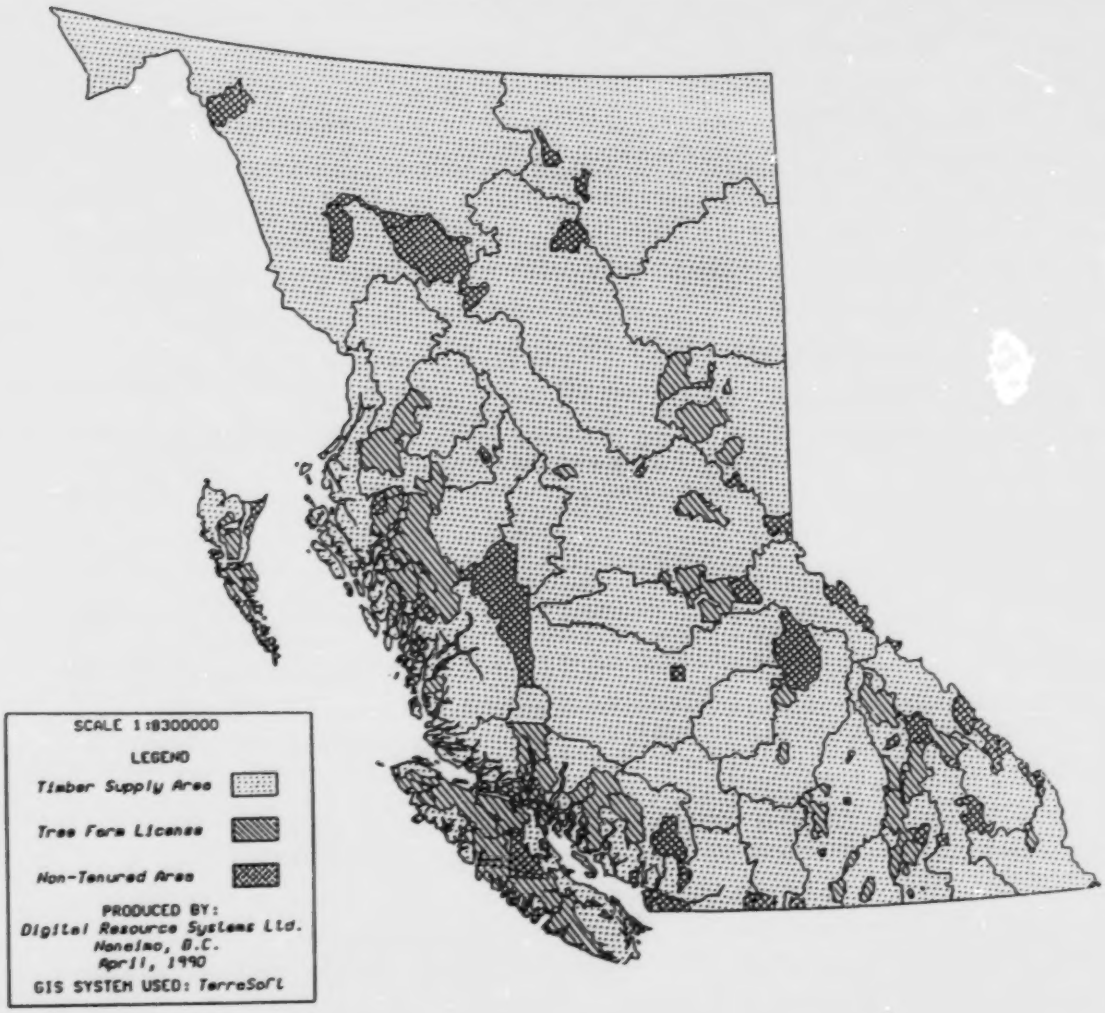
The Commission believes that the proposals contained in this section will secure the volume of wood necessary to meet the needs of small businesses. Therefore, the Forest Resources Commission has concluded it is no longer necessary to carve 5 per cent of the AAC volume out of tenure sales, except in cases where the tenure holder controls more than 50 per cent of the lesser of his manufacturing capacity or his AAC under the Resource Management Agreement.

The Forest Resources Commission believes, however, that the public should share equally in any "windfall" appreciation in the value of the tenure due to economic conditions. This could include, for example, real price increases in the value of standing timber due to scarcity or increased market demand. Half of any such 'non-earned' asset appreciation should be returned to the Forest Resources Corporation on the sale or transfer of a tenure.

The Forest Resources Commission recommends that:

75. the Forest Resources Corporation receive a 50 per cent share of any windfall gains realized from the sale or transfer of timber harvesting tenures.

Timber Supply Areas, Tree Farm Licences and Non-tenured Areas of British Columbia



SOURCE:

Province of British Columbia, Ministry of Forests, Integrated Resources Branch

6. FINANCIAL AND ECONOMIC CONSIDERATIONS

1. Introduction

In the previous chapters, the Forest Resources Commission detailed a blueprint for enhanced stewardship through a comprehensive Land Use Plan, a new administrative and financial structure, and a reformed system of tenures. In this chapter, the Commission will examine in some detail the economic foundation that will make enhanced stewardship possible.

Assigning financial values to the forest resource and the multitude of activities that take place within it, is a daunting task. Some values — wilderness preserves, parks, recreation, wildlife, watersheds — are almost impossible to quantify in any concrete, reliable way simply because society has never thought in terms of assigning monetary values to such things. The phrase "the best things in life are free" comes to play time and time again. Even assessing the obvious financial component — the forest industry — is not the simple task one might think. While the nuts and bolts of the industry — the mills, the trucks, the employment factors — are readily quantifiable, the most significant asset, the forest itself, is not. Because it is publicly owned, and timber prices are set by an administrative formula rather than a free market, the value of the forest asset base is difficult to compute.

With that in mind, the Forest Resources Commission had several studies undertaken to produce the most reliable professional assessment possible of these values. Out of those studies, the Commission reached the following general conclusions:

- The forest industry is the most significant economic force in the province, and will likely remain so for the foreseeable future. It should in no way be seen as a "sunset" industry. Its impact varies dramatically from community to community, ranging from minor in some to overwhelming in others. Making generalized statements about the economic impact of certain actions on "the industry" ignores that vital factor.
- Although there is no generally accepted means of determining the value of the standing timber in the commercial forest, there are strong indications that it is probably significantly higher than is reflected by the stumpage paid to the provincial government for its use. Society, over time, should collect a higher proportion of that value to ensure that enhanced stewardship takes place.
- It is possible to weigh the effects of different forest management goals and techniques on all values in the forest, and give forest managers a wide range of options to consider in preparing and implementing plans.
- Values for non-industrial activities — recreation, wildlife, etc. — cannot be reliably quantified with existing information. The development of inventory information (discussed in a subsequent chapter) should help in this regard.

The following sections of this chapter will outline in more detail those conclusions.

2. Income and Employment Impacts of the Forests

As a generalization, the more economically important the resource, the more good information there is about it. There are, for example, several sources of current information on the volume and value of forest products produced in the province. Monthly surveys are taken on employment in sawmills. But little is known about the annual harvest of fresh water fish — how many people participated, for how long and at what cost. Similarly, while there are statistics available to estimate income generated by downhill skiers on specific ski-hills, their cross-country counterparts are scattered through the forests all over the province.

Estimates of the economic impact of the forests are therefore heavily weighted towards commercial or industrial uses. Even the tourism sector does not have reliable statistics of forest-related employment or income and makes no attempt to assess the value of the scenic views British Columbia offers. A study on tourism to redress this deficiency is under way, however.

Following an initial review of a broad array of economic studies of the values of alternative uses of the forests, the Forest Resources Commission determined that there was little to be gained by trying to provide an all-encompassing value estimate for the forests in all uses.

Instead, the Forest Resources Commission worked with the Planning and Statistics Division of the Ministry of Finance and Corporate Relations to develop an estimate of both the employment and Gross Domestic Product (GDP) contributions of the forestry sector to the province. As well, estimates were made of the importance of the forest sector to individual, representative towns in British Columbia. These studies will be made available with the release of this report.

However, the statistics related to direct employment and contribution to GDP tell only a part of the impact of this sector on the economy. Also important are the impacts upon supplier industries, and the further impacts of expenditures of income by employees of these industries. These are commonly called the 'multiplier' effects of the sector on the economy.

To assess these "multiplier" effects, computer models have been developed to tell planners what will happen to a large mix of variable factors if changes are made in one or more of the variables. In simple terms, it allows planners to project what will happen across a wide range of suppliers and services if a mill shuts down and lays off all its employees. These types of computer models are now used extensively in economic forecasting.

Unfortunately, the most recent British Columbia government model of the economy was developed using 1984 data. Attempting to use a 1984 structural model to examine the total contribution of the forestry sector in 1989 or 1990 can produce misleading results, as the structure of industry relationships and relative sector sizes have changed. To overcome this problem, the Planning and Statistics Division of the Ministry of Finance and Corporate Relations used such known 1989 statistics as

employment figures and GDP figures to partially update the model. These results are summarized below.

In order that the relative importance of the sector be understood better, the contributions for 1984 and 1989 are given below in Table 1. In this table, sector activity is the direct contribution of the Forestry Group to employment and Gross Domestic Product. The 'group' includes logging, all processing such as sawmills, veneer and plywood mills, pulp and paper, pole manufacturers, etc.

The following tables show the magnitude of the linkages between the forest sector and the rest of the economy in 1984 and 1989. The total Gross Domestic Product (a measure of the value added to a product as it goes through all its processing) and total employment figures can be compared to the total impact for all sectors to show a flow through of benefits to the rest of the economy.

The table shows that while employment decreased over the five-year period, the productivity of the sector grew and contributed to an increase in the GDP. In part, that shows a shift to manufacturing higher value products. Reference to the tables below show that the total impact is roughly double the direct impact. The Forest Resources Commission further refined these figures from its September, 1990 Options Paper.

TABLE 1, EMPLOYMENT AND GDP IMPACTS OF THE FOREST SECTOR - 1984 & 1989

1 A, Impacts of the Forest Sector on the Provincial Economy

	1984	1989
Direct GDP Impact	8.25%	9.45%
Total GDP Impact	16.18%	16.88%
Direct Employment Impact	7.60%	7.00%
Total Employment Impact	15.40%	14.40%

1 B, Impacts of the Forest Sector 1989 (per cent of total provincial GDP)

	Forest Sector	Other Sectors	All Sectors
Final Demand Impact	5.56%		5.56%
Indirect Impact	2.88%	2.69%	5.57%
Induced Impact	0.05%	5.70%	5.75%
Total	8.49%	8.39%	16.88%
Effects of Other Sectors	0.96%		
Total Forestry GDP	9.45%		

TABLE 1, continued

EMPLOYMENT AND GDP IMPACTS OF THE FOREST SECTOR - 1984 & 1989

1 C, Impacts of the Forest Sector 1989 (per cent of provincial employment)

Production for final demand	Estimated Employment Impact
Final Demand	4.0%
Indirect - Forest Sector	2.1%
Indirect - Other Sectors	2.7%
Induced	5.6%
Total production for Final Demand	**14.4%**

In 1989, the forest sector's total (direct, indirect and induced) contribution to the provincial economy (GDP) was 16.9 per cent. On the same basis it contributed 14.4 per cent of total employment. This should not be confused with the often used phrase "the forest industry contributes 50 cents out of every dollar in B.C." This is derived from the fact that the forest sector contributes 50 per cent of manufacturing shipments. However, manufacturing shipments are only one component of the GDP. The overall contribution of the forest sector to the provincial economy is significantly less.

The use of these numbers can produce another, perhaps more dangerous set of faulty conclusions. In generalizing the impacts of particular actions, we get a false picture of what's really going on in the economy. For example, a 10 per cent reduction in logging and forestry activity would produce a net effect of less than 2 per cent on the provincial GDP. But it would have a devastating impact on the small communities where the 10 per cent reduction actually takes place.

This is not a small matter. It highlights the fact that there are two economies in British Columbia and they are split along urban/rural lines. To demonstrate the magnitude of this economic duality, the Planning and Statistics Division of the government developed estimates of the impact of local changes in forestry activity in several towns in British Columbia. In essence, they were asked to estimate the share of employment in each centre that is related to forestry activities. This requires separating out 'basic' industries and other support industries' contributions to employment in each town. (For technical details, see supporting documentation, Volume 4.)

TABLE 2

EMPLOYMENT DEPENDENCE ON FORESTRY

Williams Lake	55.6%
Kitimat	22.5%
Castlegar	67.0%

No review of economic policy can ignore these estimates. They underline dramatically the importance of forestry to the rural economy, and "averaging" the impacts of reductions in forestry activity gives a grossly misleading picture of the real impact on resource-dependent communities throughout the province.

The Forest Resources Commission also heard concerns about corporate concentration in the B.C. forest industry. Any discussion of corporate concentration must take into account the industry's international profile and its ability to compete in world markets. While some individual forest companies are large compared to other corporations in the province, they are not large when compared to their international competitors.

The Commission has concluded that the wood processing industry must be allowed to evolve into whatever structure is needed to maintain its ability to compete in world markets. That may mean further amalgamations of wood processing facilities and a further concentration of existing processing facilities. Corporate concentration among tenure holdings, however, is a different matter. The Commission believes that its recommendations for the diversification of tenure holdings (see chapter on Tenures) and the establishment of a viable provincial log market (detailed later in this chapter) will ensure the maintenance of a diverse, competitive forest products industry.

The following figure, excerpted from Price Waterhouse's Forest Products Industry Survey (1989), depicts the 50 largest forest products companies in the world. None of the top 10 companies is Canadian and only a few of the 50 are from Canada.

Figure 6

FIFTY LARGEST FOREST PRODUCTS COMPANIES IN THE WORLD* (based on Total Sales)

Rank 1989	Rank 1988**	Company	Country
1	2	International Paper	USA
2	3	Georgia-Pacific	USA
3	1	Weyerhaeuser	USA
4	4	Fletcher Challenge (1)	New Zealand
5	5	Stora Group	Sweden
6	8	James River	USA
7	6	Kimberly-Clark	USA
8	14	Stone Container	USA
9	7	Champion International	USA
10	9	Scott Paper	USA
11	12	Oji Paper (2)	Japan
12	10	Mead	USA
13	11	Boise Cascade	USA
14	13	Noranda Forest	Canada
15	17	Jujo Paper (2)	Japan
16	15	Great Northern Nekoosa	USA
17	16	Svenska Cellulosa	Sweden
18	21	Sanyo-Kokusaku Pulp (2)	Japan
19	20	Honshu Paper (2)	Japan
20	18	Modo Group	Sweden
21	32	Amcor (1)	Australia
22	34	Daishowa Paper (2)	Japan
23	24	MacMillan Bloedel	Canada
24	23	Union Camp	USA
25	22	Abitibi-Price	Canada
26	19	Bunzl PLC	United Kingdom
27	26	Kymmene	Finland
28	41	Wiggins Teape	United Kingdom
29	28	Enso-Gutziet	Finland
30	29	Buhrmann-Tetterode	Netherlands
31	27	Canadian Pacific Forest	Canada
32	35	Westvaco	USA
33	33	Domtar	Canada
34	36	Temple-Inland	USA
35	43	Rengo (2)	Japan
36	42	Metsa-Serla	Finland
37	39	Louisiana-Pacific	USA
38	37	PWA	Fed. Rep. Germany
39	47	United Paper Mills	Finland
40	30	Jefferson Smurfit (3)	Ireland
41	44	Willamette Industries	USA
42	n/a	Mitsubishi Paper Mills	Japan
43	48	Taio Paper (2)	Japan
44	31	Feldmuhle	Fed. Rep. Germany
45	49	Bowater	USA
46	45	La Cellulose Du Pin	France
47	n/a	Federal Paper Board	USA
48	n/a	KNP	Netherlands
49	n/a	Potlatch	USA
50	n/a	Fletcher Challenge Canada	Canada

* For companies to be considered, greater than 50% of revenues must be derived from forest product sales. The following companies did not meet this criterion: DRG (U.K.), Reed International (U.K.), Meyer International (U.K.), Rauma-Repola (Finland)., A. Ahlstrom (Finland), Tampella (Finland), Sonoco (U.S.A.), Avery International (U.S.A.), Esselte Business Systems (U.S.A.), Elders Resources, NZFP (New Zealand).

** The 1988 sales revenues have been restated by companies where appropriate to reflect acquisitions, divestitures and restructurings, consequently 1988 reported sales may be inconsistent with 1988 rankings.

(1) Fiscal year ended June 30, 1989

(2) Fiscal year ended March 31, 1989

(3) Fiscal year ended January 31, 1989

Based on Price Waterhouse Study.

3. Other Renewable Forest Resource Values — an Economic Point of View

As stated previously, applying the standard forms of economic analysis to the broad range of values society now recognizes in its forest land base does not produce a reliable estimate of their worth, or their contribution to the provincial economy. The data base required for such analyses simply isn't there.

However, this should in no way diminish their importance in Land Use Planning and forest management and in carrying out the Vision Statement's concept of enhanced stewardship. There is some data available, and this section will examine it briefly.

Tourism, Wildlife and Recreation Values

A number of studies have been carried out by provincial ministries on demand, level of activity and economic impact for various sub-components of the tourism and recreation sector which are dependent upon the forest lands. These studies, however, have covered only specific recreation markets and do not offer a comprehensive view of forest use. Tourism British Columbia has estimates of the total provincial market which encompass all tourism activities but do not break out separate measures for forest-related activities, visitor days or expenditures.

Tourism Canada, as part of its research program, makes estimates of the economic impact of tourism on provincial economies. However, these estimates are based on national account data. Further, Tourism Canada surveys cover the entire tourism sector and do not separate out forest related tourism activities. Recent year data is shown in Table 3.

In addition to a review of existing data sources, two background reviews were carried out for the Forest Resources Commission. The first, "Preliminary Assessment of Forestry Related Tourism Values," carried out by Woodbay Consulting Group, is an overview of tourism activity and an estimate of the current forest-dependent market. The second background study, "Adventure Travel And Land Use," carried out by Pacific North Consulting, focused on that tourism market component which is outdoors-related and generally takes place in more remote, wilderness settings. (These studies are contained in background papers released with this report, Volume 6.)

The data base for determining the extent of forest-dependent tourism and recreation is fragmented with no overall view of the patronage base. Numerous studies have been carried out on individual sectors but differing approaches, survey methods, and terms of reference make simple addition of the number of clients, revenues, or measures of value among user groups impossible. Businesses such as guide outfitters, fishing lodges, and guest ranches include clients counted in studies of activities such as fishing, hunting, and wildlife viewing.

In summary, it appears that a minimum of 3 per cent of non-residents come to British Columbia solely for its back country or wilderness values. In the order of 9 per cent to 11 per cent spend some of their time in a British Columbia wilderness/adventure pursuit. Including clients of the wilderness or back country as well as front and mid-

TABLE 3

British Columbia Tourism: Estimated Economic Impact

(Numbers in current $billion except where noted)

Indicator	1988
Share of Gross Provincial Product (1) (%)	6.0
GDP share ($bill.from GPP share)	3.6
Direct income	2.6
Total receipts (2)	3.7
Direct & indirect income, B.C. residents	4.8
Direct employment (000 person yrs)	88.4
Direct & indirect employment, B.C.(000 person yrs)	129.8
Direct provincial & municipal tax yield	0.6
Total tax yield, all governments	1.6

Source: Research Branch, Tourism Canada

1) GPP is calculated at only the national level and equals GDP at market prices adjusted for investment income flows in/out of the province. Estimates are made with Tourism Canada I/O model with StatsCan data and account allocations based on Can. Travel Survey.

2) Apparently includes some Yukon/NWT receipts but these are reportedly negligible.

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country zones, estimates of the total "outdoor" constituency could range between 18 per cent to 21 per cent of visitors.

Another way of estimating the number of recreational users of forest resources, as well as obtaining an order of magnitude estimate of the economic impact of this "nature" constituency, subsector estimates of the commercial market such as "adventure" travel and resort/lodge patronage were combined with Ministry of Environment estimates of freshwater fishing, hunting and other wildlife activities. While some adjustments have been made to avoid double counting, the sources, methodologies, base years, and sample populations for each category of recreation shown in the following table are different, and overlaps between constituent subsets may be present. Groups and subsectors excluded from this estimate include guide/outfitters (assumed to be included in Ministry of Environment hunting estimates), lodge/resort freshwater fishing (assumed to be included in Ministry of Environment fishing estimate), guest ranches, alpine/downhill skiers, cruise ship passengers, and non-resort-based saltwater fishing. The latter three groups may enjoy additional forest amenity values, however no attempt has been made to estimate or assign scenery as an attractor for these activities. The results of this are shown in Table 4:

TABLE 4

Forest-Related Tourism and Recreation Activity

Activity/Market segment	Employment (pers.yrs)	Rev./exp. 1988 $ mill	Value-added 1988 $ mill	Client days (000)
Adventure travel (1)	**1555.0**	**78.5**	**34.1**	**1044.6**
Heli-ski	115.0	25.1	9.2	54.6
X ski/ski tour	170.0	5.5	2.7	65.3
Mountaineer/backpack	250.0	8.3	4.7	113.6
Horse/trail riding	245.0	9.0	5.1	414.7
Nature observation	80.0	3.9	2.0	22.7
Scuba diving	70.0	3.2	1.3	85.0
Rafting	140.0	6.2	3.0	110.7
Kayak/canoeing	65.0	2.4	1.4	43.0
Sailing tours	315.0	9.9	3.0	60.9
Boat tours	65.0	2.7	1.1	58.8
Other	40.0	2.3	0.8	15.3
Fresh water sport fishing (2)	**1783.0**	**124.9**	**61.7**	**4754.0**
Resident	1317.9	97.5	46.8	4281.1
Non-resident	465.1	27.4	14.8	472.9
Fishing lodges:(3)(4)				
Salt water fishing	**820.0**	**50.9**	**30.2**	**206.0**
Resident	188.6	11.7	6.9	47.4
Non-resident	631.4	39.2	23.3	158.6
Wildlife viewing (non-res & com'l) (50%) (5)	**26.5**	**1.3**	**0.5**	**15.8**
Wildlife activities (6)	**10153.0**	**536.2**	**225.2**	**62222.8**
Direct	484.0	203.3	8560.3	
Indirect	52.2	21.9	53662.5	
Hunting (7)	**1915.0**	**138.2**	**61.6**	**2450.3**
Resident	1393.0	121.2	51.1	2390.5
Non-resident	522.0	17.0	10.5	59.8
Total: all activities (8)	**16262.8**	**930.0**	**413.6**	**70713.9**
Total: excluding wildlife activ.	**6109.8**	**393.8**	**188.4**	**8491.1**

Sources:

1) Economic Impacts of the Adventure Travel Industry,1987 (DPA Group Inc.)
2) Economic Values and Impacts of Freshwater Fishing in British Columbia, 1988 (Michael Stone, Min. of Env.); based on direct expenditures by residents and non-residents (Tables 3-1, 3-4, 3-5, angler-days derived from Table 2-4).
3) Fishing Lodges and Resorts in British Columbia, 1988, (DPA Group Inc. & MacLaren Plansearch Corp.); salt water lodge/resort segment expenditure Tables 8.1/8.5;value-added to revenue based on ratio 0.59 (DPA p. 8-12);res/nonres days split 73%/27% (DPA p.4-2).
4) Department of Fisheries and Oceans, Tidal/Freshwater Fishing in British Columbia, 1985, as quoted in (3) above.
5) Wildlife Viewing in British Columbia, March 1988 (Ethos Consulting/Land Sense/Youds Planning Consultants); Advent. trav. ratios of 20.5 jobs/$mill exp. and $0.35 value-added/$1.0 exp.;50% counted as non-res.; res. in (7) below.
6) "Report on the British Columbia Survey of Non-hunting and Other Wildlife Activities for 1983," 1986 (Roger Reid et al) updated in (7) below; indirect wildlife activity days counted as 0.5 days; rev/exp table 5,(8); Value-added=0.42 x dir. exp. (2); preservation ($126mill.) and willingness to pay ($228mil) values non counted.
7) Table 3 & 4, (expenditure), Table 7, (employment) "Update of the Values of Wildlife, 1989, Roger Reid; Tables 11.2 (client days, 1981), "Value and Characteristics of Resident/Non Resident Hunting," 1985, Roger Reid, Min. of Env.; willingness to pay ($60.4mill) not included.
8) Not included are Guide Outfitters of British Columbia: ("Opportunity Analysis,"1989, DPA Group for BC Ministry of Tourism and Provincial Secretary), guest ranches, trapping, cruise ship passengers, or non-lodge/resort saltwater fishing.

Combining commercial tourism and wildlife recreation activities gives an order of magnitude estimate of 70.7 million client-days, 16.3 thousand person-years of employment and value-added contribution to GDP from direct expenditures of $400 million. If the Ministry of Environment wildlife activity estimates are excluded, the estimated commercial recreationist impact amounts to 8.5 million user days, 6,100 jobs, and $200 million value-added.

The health of the tourism sector depends heavily on the ability of B.C. residents to "purchase" recreational pursuits of all kinds — and that requires a relatively well-paid work force in the province. Any attempt to weigh competing forest resource values and make value trade-offs needs to take this fact into consideration.

Watershed and In-stream Water Values

Government regulation of rivers and watershed lands has generally focused on fishery conservation and water supplies for agricultural, industrial and municipal uses. But while demand for consumptive uses is growing, so too, is the desire to retain water in rivers and lakes for environmental, social, scientific, recreational and cultural uses.

Watershed management of Crown lands has focused chiefly on community watersheds. Approximately 240 community watersheds (which represent 86 per cent of the total) are more than 50 per cent Crown land, while 135 community watersheds are entirely Crown land. (Guidelines For Watershed Management of Crown Lands Used as Community Water Supplies, Report of Task Force, 1980).

As discussed in a recent paper from the Recreational Fisheries Branch, (A New Approach to Angling Guide Management, B.C. Ministry of Environment, 1988), the great increase in wilderness recreation, commercialization of sport fishing, and the threat of deterioration in quality through overuse is prompting a more active management role to preserve wilderness fishing.

Issues surrounding in-stream water values include fisheries habitat, changes in siltation, deterioration of bird sanctuary, deterioration of water quality, inundation and erosion of riparian properties and degradation of aesthetic and recreational values. As pointed out in the 1985 Inquiry on Federal Water Policy (Pearse, P.H., Environment Canada), equitable allocation among competing uses suffers from lack of knowledge of in-stream flow requirements and the difficulty in establishing values for the non-market element of the resource.

Range Land Values

Of the approximately 10 million hectares of range land in British Columbia, almost 85 per cent is Crown range administered by the Ministry of Forests. Most is located within provincial forest boundaries and managed in a multiple use context. Crown range provides in the order of 924,000 animal unit months (AUM) of forage per year. The most extensively used range lands are located in the South and Central Interior. Forecast growth in the cattle industry would indicate a deficit in Crown forage, equivalent to perhaps 20 per cent of the present resource or 200,000 AUM's by 1993.

The structure of grazing fees is based upon traditional use by the cattle industry. However, in some areas of the province, grazing by horses and use by guides, outfitters and packers are major activities. Some sheep are also grazed on Crown land.

The provincial beef industry consists of the ranching sector producing feeder calves and yearlings and a relatively smaller feedlot industry located in the Southern Interior and Lower Fraser Valley. In the Southern Interior, herds spend mainly the spring, summer and fall on Crown and private range lands. In the North Central and Peace regions, naturally occurring range land is more limited and there is more reliance upon private and Crown improved pasture land and grazing of hay fields in late summer and fall. Income and employment impacts generated by beef producers, excluding activity in the slaughter and processing industry, are shown in Table 5:

TABLE 5

Impact of the Primary Beef Production Sector

Item	GDP (1988 -$million)	Employment (person years)
Direct (producer) income	81	2207
Indirect (supplier) income	29	418
Induced impact	19	443
Total income	**129**	**3068**

Source: B.C. Beef Industry Study: A Statistical Profile,
B.C. Ministry of Forests, 1989 (Talisman Land Resource Consultants).

As pointed out in a Ministry of Forests Range Program study, the diversity of forage opportunities and the range of values among areas do not permit any definitive estimate of the net value of range land. To complicate the issue, other sectors such as wildlife, recreation and silvicultural programs also enter the range land calculus as joint costs and benefits.

As noted in the 1989 Ministry of Forests Range Program Review, values of range and Crown tenures not accounted for in grazing fees tend to become capitalized into private ranch land values. In the examination of cost recovery goals for the range program, revenues from commercial grazing would have to be increased between 45 per cent and 55 per cent to cover those government expenditures in support of the commercial livestock industry. For 1988/89 the Commercial Use portion of the Ministry of Forests Range Program budget was estimated at $2.7 million versus expected grazing revenues of $1.8 million. (Range Program Review, Ministry of Forests, 1989.) These are direct revenues, however, and do not take into consideration the many economic benefits that flow indirectly to local communities, as well as to the other users of the land.

Since grazing fees are administrated prices with perhaps only coincidental relationship with actual market rates, and given that there is a shortage of Crown Range at current rates, these approaches tend to underestimate the economic value of range land. If the average fee per AUM were doubled, this amount would constitute less than five per cent of net income or GDP generated by the beef ranching sector.

Hunting and Trapping Values

Again, many of the statistical estimates of the impact of hunting activities are included in estimates for broader-based topics such as tourism and recreation.

B.C. residents spent an estimated $125 million on hunting activities throughout the province in the 1988/89 season. This figures includes licence fees, transportation, food, accommodation, taxidermy, butchery, guns, ammunition, and related equipment. The contribution to the provincial treasury of all this activity was $6.5 million.

In 1988/89, a total of 2,428 trapping licences were sold to the general public, and an unknown number of First Nations people also trap. Most trapping in B.C. is done to provide a livelihood, but there are significant numbers of people who trap for recreation, or as a tradition.

4. An Asset-Based Approach to the Value of the Timber

Determining the value of publicly-owned commercial timber harvested at government controlled rates and government controlled prices is extremely difficult. In the absence of free market prices, few of the normal indicators of value apply. The Forest Resources Commission asked consultants to examine alternative approaches to measuring the 'value' of the timber in the commercial forests.

This asset-based approach used three indicators to determine the underlying value of the timber — provincial stumpage rates, private market log sales and sales of tenure (this study is appended to the Commission's report.)

The consultants treated provincial stumpage as though it were interest paid on an investment. It asks, in essence, how large a bond would the government have to own to receive an annual dividend, or interest payment, equal to its net stumpage revenue. Obviously, the rate of interest is a key factor in doing this "reverse" calculation, and must be fairly determined to produce a useful estimate of value.

The analysis was conducted using the most recent income and expenses available for the Ministry of Forests, fiscal year ending March 31, 1990. The following table summarizes the income and expenses for that period.

TABLE 6

Ministry of Forests - Income & Expenses

CURRENT STUMPAGE INCOME VALUATION

MINISTRY OF FORESTS, March 31, 1990	(millions)
REVENUE	$ 711.0
OPERATING EXPENSES	$ 351.8
OPERATING INCOME	$ 359.2
SILVICULTURE EXPENSE	$ 206.0
NET CASH FLOW	$ 153.2
CASH FLOW RANGE	
LOW	$ 82.1
BASE	$ 153.2
HIGH	$ 224.3

The 'cash flow range' in the above table is designed to allow for market fluctuations and represents a variance of 10 per cent in revenues.

Three separate discount or interest rates were used in modeling the asset valuations. The techniques used to develop these rates are described in the background study. They are:

- 13.50% a normal return to equity investments
- 11.44% a weighted rate of return using a "utility"debt/equity ratio of 80/20
- 7.15% a real, regulated 'utility' rate of return that allows for inflation to be recaptured in prices.

The income valuation results are detailed in Table 7:

TABLE 7

Current Stumpage Income Valuation Approach

	Low	Base Case ($ billion)	High
Equity Model, (discount rate @ 13.5%)	0.61	1.14	1.66
Leveraged Model (80/20), (discount rate @ 11.44%)	0.72	1.34	1.96

In essence, the present stumpage return to government, using an industry rate of return on equity of 13.5%, suggests a value of timber assets in British Columbia of $1.14 billion.

While the majority of the province's timber is harvested on tenured public lands and processed by the companies that harvest it, there are some market mechanisms in place that, imperfect as they are, at least provide an opportunity to make a market calculation on the value of standing timber.

The industry purchases logs on the Vancouver log market and through the small business enterprise program. In addition, the tenures themselves are bought and sold by private companies.

Using the values represented by these private transactions, the consultants produced a value of the asset base. The table below details these values:

TABLE 8

Market Valuation Approach Summary

Valuation Average	Base Case ($ billion)
a) discount rate @ 13.5%	4.7
b) discount rate @ 11.44%	5.5
c) discount rate @ 7.15%	8.8

Clearly, the asset base generated through private transactions is markedly higher than the asset base generated through provincial stumpage — no matter which of the three private valuations or the three discount or interest rates is used. In fact, the private transactions produce an asset value more than four times higher than that found for stumpage. This suggests that industry is capturing a much higher value from the forests than is the government. Stumpage payments are not capturing the full value of the resource. It also suggests that companies are willing to pay a competitive, rather than regulated price for access to timber. The difference between these two values is presently being captured by private industry upon the sale of tenures and not by the Crown. It is the view of the Forest Resources Commission that this 'gap' in valuation should be closed.

The conclusion of the study was that, from the province's perspective, a value of the timber of between $8.3 and $8.5 billion was supportable.

(A complete discussion on the valuation estimates is available as a background document in Volume 4.)

5. Management Options for a Forest Estate

The role of enhanced stewardship and managing the forests for all renewable resource values has been a central theme throughout this report. A land use strategy has been proposed to assess the land capabilities. Within that strategy, goals will be established for protecting and enhancing all values. Area-based tenures and lands managed by the Forest Resources Corporation will directly relate the Land Use Plan to the management plans for the tenure.

Fundamental to these proposals is the belief that a variety of management options exist that are both economically feasible and sustainable through time. Any option selected can and should be audited to ensure that performance reflects both commercial and non-commercial management objectives.

To demonstrate the broad variety of management options possible and provide an example of a potential system of accounts, a 'pilot study' for a forest estate was prepared for the Forest Resources Commission by a consortium of consulting foresters and economists.

The study used data specific to a particular land base in B.C. It is important to point out, however, that the quality of the inventory data was not uniform across the full range of values. This underlines the need to generate improved inventory data — a need that has already been outlined in other chapters of this report. Nevertheless, the information available was sufficient to meet the illustrative goals of the pilot study.

In much the same way as computer models are used to analyze the economic impacts of a variety of economic factors, they can be used to analyze a variety of forest management scenarios. This study analyzed the impact of differing silviculture regimes, different utilization standards, extended rotation periods, and alternative harvesting methods. It put those variables together with management goals and objectives that vary among the full range of values — sometimes emphasizing the timber production values, other times emphasizing the recreation or wildlife values.

The study produced fourteen alternative management options and estimated the results in terms of Allowable Annual Cut, harvest area, range, recreation, wildlife, employment, net revenues, taxes and the 'bonus' that could be bid by an operator to manage under each option. The results of these alternatives are presented in Table 9A & 9B.

SUMMARY RESULTS OF ALTERNATIVE MANAGEMENT SCENARIOS, PHYSICAL OUTPUT INDICATORS

MANAGEMENT SCENARIO	TIMBER INDICATORS			RANGE INDICATORS		WILDLIFE INDICATORS		RECREATION INDICATORS	
	200 Year Average AAC (000 m^3)	Harvested Land (ha/yr)	Employment (man-years)	Animal Unit months/yr	Employment (man-years)	Deer Pop. (overwintering pop.)	Moose Pop. (overwintering pop.)	User days/year	Employment (man-years)
Alternative Silviculture Regimes at Standard Utilization									
1. Natural Regeneration	105	338	204	3400	3	160	235	12000	3
2. MOF Basic Silviculture	115	336	227	3400	3	160	235	12000	3
3. Select Silviculture	131.3	343	262	3400	3	160	235	12000	3
4. Maximize Wood Production	174.5	416	347	3400	3	160	235	1200	3
Allow Lower Utilization Standards									
5. Natural Regeneration	55	270	107	3400	3	160	235	12000	3
6. MOF Basic Silviculture	79	311	157	3400	3	160	235	12000	3
7. Select Silviculture	79.5	255	157	3400	3	160	235	12000	3
Extend rotation period									
8. Old Growth Forest and MOF Basic Silviculture	89.7	249	177	3400	3	160	235	12000	3
Alternative Harvesting Methods									
9. Shelterwood Harvest and MOF Basic Silviculture	130.8	716[1]	258	3400	3	200	295	12500	3
10. Shelterwood and Select Silviculture	149	739[2]	294	3400	3	200	295	12500	3
Management Emphasis Other Resources									
11. Recreation	98.8	253	191	3400	3	160	235	24000	6
12. Wildlife	97.2	255	191	3400	3	370	470	14000	3
13. Range*	105	340	206	10200	9	80	235	12000	3
14. Range and Wildlife*	92.5	251	181	7000	6	330	450	13500	3

Notes:

1. Average harvest 384 ha/year, thinning 334 ha/year
2. Average harvest 406 ha/year, thinning 333 ha/year

* Scenarios developed subsequent to publication of original study.

TABLE 9A

SUMMARY RESULTS OF ALTERNATIVE MANAGEMENT SCENARIOS, VALUE INDICATORS

TABLE 9B

MANAGEMENT SCENARIO	200 Year Average AAC ('000 m^3)	Average Net Value Generated Per Year ('000$)	200 Year Average Value ($/$m^3$)	Average Stumpage Payment ('000$)	Labor and Company Taxes/yr B.C. ('000$)	Labor and Company Taxes/yr Canada ('000$)	Surplus* Value ('000$)
			FINANCIAL INDICATORS				
Alternative Silviculture Regimes at Standard Utilization							
1. Natural Regeneration	105	$1,450	$13.81	$ 869	$546	$ 820	$ 8,833
2. MOF Basic Silviculture	115	$1,370	$11.91	$ 953	$583	$ 875	$ 6,322
3. Select Silviculture	131.3	$1,370	$10.43	$1,104	$852	$ 978	$ 4,039
4. Maximize Wood Production	174.5	$1,717	$ 9.84	$1,459	$860	$1,290	$ 3,916
4A. Maximize Wood Production - No Stumpage on Increment**	174.5	$1,717	$ 9.84	$ 953	$894	$1,381	$11,580
Allow Lower Utilization Standards							
5. Natural Regeneration	55	$ 920	$16.73	$ 495	$294	$ 441	$8,420
6. MOF Basic Silviculture	79	$1,040	$13.16	$ 693	$405	$ 607	$5,192
7. Select Silviculture	79.5	$1,180	$14.84	$ 690	$417	$ 625	$7,420
Extend rotation period							
8. Old Growth Forest and MOF Basic Silviculture	89.7	$1,250	$13.94	$ 748	$467	$ 700	$7,546
Alternative Harvesting Methods							
9. Shelterwood Harvest and MOF Basic Silviculture	130.8	$1,055	$8.07	$1,055	$631	$ 947	$0
10. Shelterwood and Select Silviculture	149	$1,447	$9.71	$1,249	$719	$1,079	$3,007
Management Emphasis Other Resources							
11. Recreation	98.8	$1,220	$12.35	$ 830	$503	$ 755	$5,853
12. Wildlife	97.2	$ 862	$ 8.87	$ 760	$476	$ 714	$1,548
13. Range**	105	$1,029	$ 9.80	$ 869	$517	$ 776	$2,408
14. Range and Wildlife**	92.5	$ 672	$ 7.26	$ 672	$443	$ 665	$ 0

* Present net value at 5% for the next 50 year period
** Scenarios developed subsequent to publication of original study

In reviewing the results of this study, several points should be borne in mind. The first is that these results apply to the specific area studied, and while the principles might apply to other parts of the province, the specific data and conclusions definitely do not. The second is that the results simply show what happens to a whole range of variables when any one or more of them is altered. They do not give a 'best' option — that's the decision made by society.

What the study demonstrates clearly is that there are all kinds of options for society to consider, and selecting any one always has benefits and costs.

All the options presented in this study are sustainable. With the exception of one of the shelterwood systems (with the basic silviculture requirements of the Ministry of Forests), all would permit a 'bonus bid' (revenues to the government) in terms of excess income over costs. A full range of alternatives is available to managers of individual forest estates, given guidance by public choice and established goals. It is interesting to note, however, that the private manager's choice in the above options would be to do nothing in terms of silviculture and let the site regenerate itself. The primary gains from intensive silviculture go to the government in the form of increased tax revenues and increased employment.

The study for the Forest Resources Commission also provided an accounting or auditing framework with which to track the performance of the manager in meeting these goals. As stated in the tenure section, the security of the tenure will be based on performance audits that show goals and objectives have been achieved. A system of accounts is presented below that could form a basis for this audit.

6. A System of Accounts for a Forest Estate

As shown in the previous section, once management goals and objectives are established, there is a great degree of flexibility available in achieving those goals.

Establishing a framework for monitoring the performance of a tenure-holder/resource manager in meeting these goals is an important consideration. Equally important are assurances that the 'plan' adopted is sustainable through time. Many forest values have no income statement to verify that values have been produced. While the value of timber harvesting is measurable, the loss of other values through the timber harvesting process may not be measurable. Neither will it be simple to assess the value of the depletion of the timber resource through too rapid a rate of harvest.

The primary concern lies in the difference between depleting a resource and ensuring that sufficient income is re-invested to ensure constant income flows or wealth creation through time. A basic rule of renewable resource exploitation is to not harvest in a particular time period more than the incremental growth of the resource in the same time period. To do so will, at best, lower future yields and, at worst, might exhaust the resource. For example, a stable grizzly bear population may depend on a minimum number of "pairs" in a particular watershed. Drop below that number, and the population will decline.

The pilot study conducted for the Forest Resources Commission on a forest estate established a system of accounts that could be used to 'track' management performance in a business plan format.

Two principal accounts can be established to monitor additions and deletions throughout a year of both physical attributes, such as wildlife forage production or recreational use, and other market-valued activities, such as timber harvesting and silvicultural expenditures.

'Physical' accounts and 'value' accounts can be established to monitor market transactions such as log sales and management expenditures, and additions and deletions to physical stock (such as wildlife.) This type of accounting is typical of annual corporate reports, with the addition of non-market factors or values.

The pilot study established a format that would be useful in auditing 'tangible and measurable' results from stewardship activities. It provides a first step in establishing a long-term or rotation-length approach to forest management. The Forest Resources Commission believes this approach will generate a high level of confidence in the adequacy of management efforts and expenditures for non-market forest values, as well as the long-term sustainability of all values.

7. A Province-wide Log Market

British Columbia's timber harvesting and wood processing industries were established upon a competitive log market. Prior to World War II, the coastal waterways of British Columbia provided a cost-effective link between large numbers of independent loggers and wood processing plants and export markets. There was a distinct separation between logging companies that harvested trees and the sawmills that processed them.

The large capital requirements of building processing facilities and the major costs of developing and maintaining international markets led to both a consolidation of efforts among milling operations and a move to integrate backwards into logging operations to ensure supplies of logs.

By the mid-1950s, it was clear that the number of small and large independent loggers was steadily declining. The high number of relatively large companies that worked exclusively in the woods, harvesting timber for sale on an open market, had virtually disappeared. Logging had become a resource extraction function of large integrated companies simply cutting wood on a variety of licences for their own mill requirements.

Twenty years later the trend was still going strong, and two things became clear: the competitive log market would ultimately disappear if the trend towards total integration were not stopped, and its usefulness in providing competitive stumpage price calculations was open to challenge.

To date, nothing has halted the trend. Fewer and fewer companies control the rights to harvest Crown timber. The government has had to withdraw 5 per cent of

industry's cutting rights in order to allow the establishment of new, value-added manufacturing operations. And, as seen in the 'asset' valuation analysis conducted for the Commission, the value of the forest asset base has been assimilated by forest companies, with a consequent reduction in the stumpage collected by the government.

In other chapters of this report, the Forest Resources Commission has recommended that a significant volume of logs be made available to the processing sector on a competitive basis. This re-adjustment in tenure allocation includes an increase in small area-based tenures for companies or individuals without primary processing facilities and a significant share of the Allowable Annual Cut being put on the market by the new Forest Resources Corporation.

The Commission believes that the establishment of a province-wide log market represents the only way that the province can realize full value for its resources and generate the income required to fulfill the enhanced stewardship role of the Vision Statement. The measures foreseen by the Forest Resources Commission in establishing a market are neither cumbersome nor costly to implement. The basic requirements are simple: a sufficient volume of logs available for interested purchasers; a notification system that lists (by location) the present and future availability of logs by size, species and where possible grade; and a reporting of transaction prices on a similar basis. Given open access by sufficient buyers and sellers, the market will 'make' itself.

8. Wood Fibre Exports

Log exports have been restricted in British Columbia since 1912 through legislation in the Forest Act. The fact that the restrictions have been in place for so long a period of time has allowed Canada to retain an exemption from the prohibition on resource export controls under the General Agreement on Tariffs and Trade (GATT.) Any changes considered to the present export restrictions should be reviewed within the context of a potential loss of this exemption.

The British Columbia Government cooperates with the Federal Government (which has jurisdiction over international trade) in determining whether unprocessed logs can be exported. The common rule of thumb in qualifying for an export permit is whether the logs are surplus to the needs of domestic processing facilities.

The absolute level of log exports in the province has historically remained low, particularly in comparison to exports from the U.S. Pacific Northwest States and Alaska. With few exceptions, the export of logs is a 'coastal' practice, with few logs originating from the Interior of the province. The recent introduction of a tax on log exports from the south coastal region will move the concentration of log exports to the north coastal area of the province. Provincial statistics on log exports are misleading, however. While log exports have represented a small proportion of the total provincial Allowable Annual Cut, they can represent a significant proportion of the cut in the area in which they are concentrated.

In remote coastal areas, where much of the forest is over-mature, logging would not take place without exports. A lack of domestic markets for certain types and grades of logs, or the overall cost of logging, renders any other type of market uneconomic.

Discussions at the Commission's public meetings indicated the 'export' of logs between forest districts was a more common problem. Many felt that local forests should be used to support local manufacturing facilities. However, the need for mills to be able to compete in international commodity markets was generally recognized to be such an overriding concern that few felt that mills should be made inefficient by restrictions on the movement or trading of logs.

The present restrictions on log exports go a long way towards ensuring domestic availability of logs while providing an 'outlet' for surplus logs. The development of a province-wide log market will substantially improve the prospects of exports being further reduced by a more efficient market distribution mechanism. The Commission believes it is in the long-term interest of British Columbia that as much wood as possible be processed within the province.

The Forest Resources Commission is interested in understanding why foreign buyers can pay large premiums for logs. British Columbia softwood product manufacturers are some of the most efficient in the world, with favourable costs compared to producers in such markets as Japan. If the primary reasons for these premiums lie in the production of specialty products or in market control, it would be of some value to the province to develop further both the product market information and market access that would enable the expansion into these production opportunities in British Columbia.

There was little discussion in submissions to the Forest Resources Commission concerning wood chip exports, as most were concerned with the appropriate pricing of chips to pulp mills, and the salvage of logs from logging sites for chipping.

The export of chips does indicate a loss of opportunities for further processing of wood products in-province, in much the same way that the export of logs or cants (square logs) does. At the same time, exports provide income that permits other economic activities, and in some cases avoids wasting of resources.

The Forest Resources Commission believes that the export option is valuable in certain instances, but that other alternatives should be explored more vigorously in terms of further processing of logs, chips and cants prior to export. The Commission intends to re-visit these topics in subsequent reports.

7. FOREST RESOURCE INVENTORY AND ALLOWABLE ANNUAL CUT

1. Inventory of Renewable Forest Resource Values

As stated in the chapter outlining the Land Use Plan, accurate and up-to-date inventories of all forest values are critical to the success of any resource management policy. They form the basis for land use classification decisions and provide the raw materials used to determine the appropriate level of enhanced stewardship called for in the Vision Statement. Without this information, Land Use Planners and forest managers are severely hampered in making intelligent choices and recommendations. Sadly, the state of renewable forest resource inventories in this province is inconsistent at best, and woefully inadequate at worst.

A significant number of British Columbians depend, in one way or another, on current activities in the forests, therefore, it is not feasible to shut everything down while these inventories are fully developed. Planning must go ahead, and decisions must be made using the best information available. But the Commission believes that the current state of inventory information is a disgrace, given the importance of all renewable forest resources to the people of British Columbia. It is imperative that inventory deficiencies be addressed as quickly as possible.

The province's renewable forest resource inventories suffer from an uncoordinated approach by the several ministries and agencies, both federal and provincial, responsible for collecting data in their specific areas of jurisdiction. Different ministries and other agencies use different measuring standards, different land boundaries, and have different goals and objectives — with the predictable result that the various systems are largely incompatible. There is a wide range in quality, completeness and availability. Integrated resource management and enhanced stewardship, based on a recognition of all forest values, are extremely difficult with such a fragmented and inconsistent body of information. Early in its deliberations, the Commission recognized these shortcomings and in its interim report recommended that: "The government immediately examine and implement ways by which the full range of forest related inventories can be made standard and able to be used on compatible systems while, at the same time, retaining the values for which they were originally intended."

Ten provincial ministries maintain a wide variety of resource inventory data. They are the Ministries of Energy, Mines and Petroleum Resources; Forests; Crown Lands; Environment; Parks; Tourism; Transportation and Highways; Municipal Affairs, Recreation and Culture; Agriculture and Fisheries; and Native Affairs. In addition, B.C. Hydro, B.C. Rail, the B.C. Assessment Authority and the Royal B.C. Museum have their own specialized inventories. At least two federal government departments — the Department of Fisheries and Oceans and the Department of Indian and Northern Affairs

—are also directly involved through agreements with the provincial government for anadromous fish inventory and water resource management. A complete list of these inventory responsibilities is contained in the last section of this chapter.

There have been attempts in recent years to rectify these inconsistencies and inadequacies and implement a more coordinated approach to inventory collection, but with only limited success. The Forest Resources Commission raised this concern in the chapter on Land Use Planning and has recommended that the Ministry of Crown Lands be responsible for coordinating all forest resource inventories on Crown lands in the province. Improved inventories of wildlife and fisheries habitat, range, water, soils, timber, recreation and tourism potential are needed to assist in the preparation of sound, reasoned Land Use Plans and renewable forest resource management plans. They will also be useful in helping to quantify what benefits accrue to society from land use decisions that involve value trade-offs.

An overall master plan is essential for the development of the inventories of renewable forest resource values. These inventories should be developed within a framework that ensures all data essential to forest resource planning is collected. The inventories must also satisfy the needs of resource user groups, and the public must have ready access to the information contained in them.

The Forest Resources Commission has concluded that a Provincial Forest Resource Inventory Committee is needed to plan and guide this process. The Committee would report to the Minister of Crown Lands and would develop general objectives and standards, and would establish inventory priorities. This policy making committee would be comprised of technical experts from the resource ministries and representatives from industrial and non-industrial resource user groups and individuals. This multi-disciplinary representation must ensure that a standardized compatible system for conducting and maintaining forest resource inventories in the province is developed. The Commission believes it is important that the inventory process apply to all lands, including parks, wilderness areas, ecological reserves, etc. Only with a complete picture of resource values in all lands can the best land use decisions be made.

Because of the economic importance of timber production in British Columbia, timber inventories are, in general, more comprehensive than inventories for other values. Inventories for other values must be brought up to much higher standards. However, there are serious deficiencies in the province's timber inventories that also require attention. These deficiencies are discussed in detail in subsequent sections of this chapter.

The Forest Resources Commission recommends that:

76. the Government of British Columbia undertake a commitment to complete inventories for all renewable forest resource values using standardized compatible systems;

77. a Provincial Forest Resource Inventory Committee be established to plan and develop a program for these inventories.

2. Timber Inventories

The forest industry is by far the most significant economic force in the provincial economy, representing billions of dollars of capital investment, thousands of jobs, and hundreds of million of dollars annually in provincial revenues. A more detailed account of the industry's importance to the province is contained in the chapter on Economic and Financial Considerations.

In that context, the importance of accurate and complete inventories of the trees growing on provincial lands, the different productive capacities of those lands, and the reliability of future growth forecasts cannot be overstated. As the industry moves from harvesting mature, natural forests to growing "second growth" managed forests, the reliability of inventory information becomes even more important. Adding to the importance of this information is the fact that changing social values are demanding more from the forests than commercial timber. There is tremendous pressure to withdraw forest lands from commercial timber production for parks, wilderness preserves, recreation areas, etc. To make intelligent choices, society must know what resources are there and what the physical and biological capacities of the land are.

The existing provincial timber inventory was completed more than 20 years ago. It provides inventory statistics for large geographic areas, to allow general strategic planning and determination of harvesting volumes through Allowable Annual Cuts. Data collectors concentrated on commercial timber volumes at the expense of other information. As a result, deciduous tree stands, younger coniferous stands and stands considered non-commercial received low priority for sampling. As well, the inventory was not designed to provide reliable data on site productivity or growth rates, and so is of little use in forecasting future timber yields.

The timber inventory must provide both an account of growing stock in the mature forests and an accurate assessment of the growth rates of the immature forests. It must also provide the information necessary to predict the yields these new crops of forests will produce so that reliable projections of future wood supply and potential harvest levels can be made.

After reviewing several diverse timber inventories, the Forest Resources Commission concluded that the provincial timber inventory is outdated and weak in several aspects. The current inventory cannot reliably estimate the volume of specific timber stands, nor can it provide dependable estimates of site quality and growth potential. And there is no regular schedule for updating the inventory. As a result, planners and forest managers have limited confidence in the information they must use as a basis for planning and assuring enhanced stewardship.

A more accurate timber inventory must be completed province-wide over the next 10 years to give Land Use Planners a reliable information base. Problem areas, and those areas under pressure already, should be given priority and completed within 5 years. A good inventory is also important to ensure that harvesting rights are allocated equitably, with cut levels neither over nor under what is deemed appropriate.

The Commission has been advised that the statistical reliability needed for Land Use Planning and enhanced stewardship will require a greater emphasis on field sampling. The inventory data base will have to be expanded to include information from operational inventories and silviculture surveys. The data base should be tied to a uniform system of geographical references. This will allow forest planning to take full advantage of the utility of computer-based mapping systems.

The new statistical information should follow supply block boundaries within Forest Districts. It appears logical to retain the supply block boundaries as they can be used to define the Land Use Planning units. The current inventory is based on units larger than the supply blocks. The largest unit for inventory design will be the supply block. This will provide greater reliability for planning and a higher degree of confidence.

The Ministry of Forests is responsible for maintaining the inventory of Crown forests. Thus far, the forest industry and other resource groups have had no involvement in conducting the timber inventory in Timber Supply Areas. As the new timber inventories will be designed for use within a Forest District, it is essential that the end-users have input into the new program.

The Forest Resources Commission has concluded that a Timber Inventory Task Force comprising a mix of public and private technical experts and inventory users be formed to direct the development of the new inventory program. The task force will be responsible for setting technical standards and determining priorities for completion within a 10 year period. In general, the first priority for attention should be areas where overcutting is suspected. This Timber Inventory Task Force would report to the Provincial Forest Resource Inventory Committee.

In 1988, the Ministry of Forests began implementing a new 10 year re-inventory program. While the new program improved the updating of classification and made data more accessible, it did nothing to improve the accuracy of the information or the design of the data base. As the Forest Resources Commission is recommending that a new provincial inventory be planned and implemented, it is essential that an immediate and critical review of the current re-inventory program be completed within the next 12 months. This review must assess the technical merits of the re-inventory program and recommend what components to include in the new inventory. It should also define what data in the current inventory is still useful, and what aspects of the re-inventory program should be cancelled or revised. The Timber Inventory Task Force should conduct this review on a priority basis.

The lack of a continuous inventory program has meant that forest planning is often completed with an outdated, incomplete inventory data base. New computer-based inventory techniques make it technically feasible to maintain and update a timber inventory more easily. While the Forest Resources Commission recognizes that the Ministry of Forests is already using these techniques, it also believes that a program of continuous inventory updating should be introduced. It can be accomplished in the design of the new inventory program. This will ensure that the most recent inventory statistics are available for local resource planning and yield analysis.

The current timber inventory is maintained on an extremely large computerized geographically-referenced data base. The inventory data is easy to retrieve and available for use in planning. The system is easy to access and can respond to specific requests for inventory reports. As a result, a number of outside groups and agencies have made requests for inventory information. For this reason, a quality assurance/quality control system is needed to ensure standards of definition and compatibility within and across data bases.

There is a strong public perception that second growth forests will produce less volume per hectare than the mature stands, and that this in some way indicates poor forest management. After reviewing inventory data, the Commission concluded that data on stand dynamics and growth rates is woefully inadequate. As a result, reliable computer projections about future timber yields in these forests cannot be generated. Users are unable to predict with confidence future harvest levels, and they can't reliably predict the impact on yield of various silvicultural treatments. When one considers the hundreds of millions of dollars spent annually on forest renewal, this failure to provide reliable growth and yield projections is quite disturbing.

The Forest Resources Commission is aware that the Forest Productivity Councils of B.C. have been established to oversee the development of a provincial data base of growth and yield research plots, and to coordinate the establishment of new field installations designed to assess the growth response to silvicultural treatments. The Councils also facilitate cooperation in the program between the forest industry and the Ministry of Forests. These Councils could be more effective if they were coordinated through an independent body reporting to the Minister of Renewable Natural Resources.

The Forest Resource Commission recommends that:

78. an updated provincial timber inventory, complying with new standards, be completed over the next 10 year period;

79. the timber inventory update must initially focus on problem areas, and complete them within the next 5 years;

80. a Timber Inventory Task Force, comprised of technical experts from private and public resource users, be established to design and plan the development of an accurate timber inventory;

81. the Timber Inventory Task Force should immediately conduct a critical review of the present Ministry of Forests' Re-Inventory program and report within the next 12 months;

82. the new inventory program must be designed and funded to provide reliable statistically sound data that can be used by local resource planning groups (and other resource interests);

83. the new provincial timber inventory should be structured on land management units with boundaries approximating

the supply blocks within Forest Districts. The same boundaries should be used for the inventories of all renewable forest resource values;

84. a system for continuous updating of the provincial timber inventory must be established;

85. a growth and yield program to quantify the growth rates of the second growth forests, for all commercial species in the province, must be established on a systematic, priority basis;

86. inventory designs vary to suit the objectives of the intended use.

3. Allowable Annual Cut Determination

The Forest Resources Commission heard a great deal of concern that the provincial forests are being overcut — that the present level of harvest is not sustainable in the long run. The Commission has examined this concern in some detail in a review of the Allowable Annual Cuts determined for seven forest management units in the province. The report detailing this review is available as a background document.

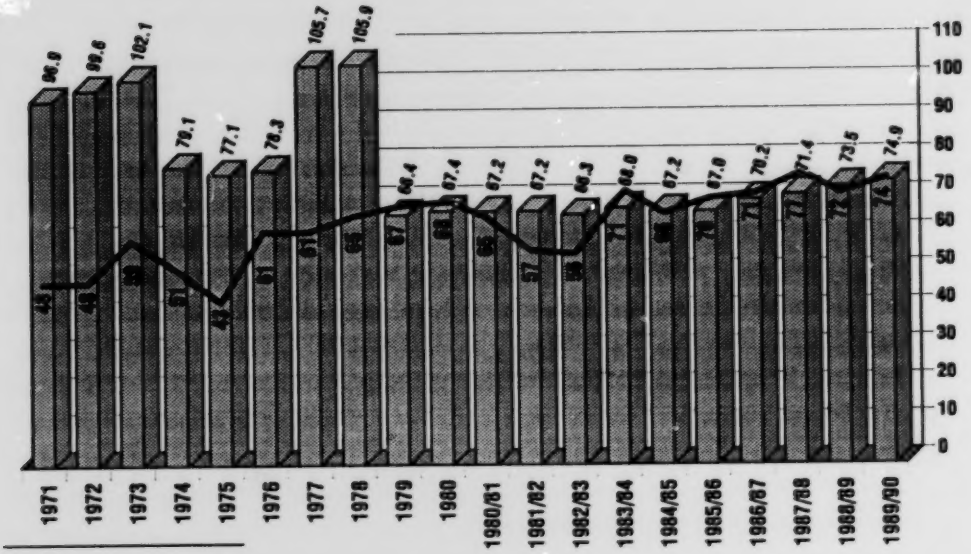
The Ministry of Forests regulates the volume of timber harvested annually from Crown land through a control mechanism called the Allowable Annual Cut (AAC.) The determination considers several key factors:

- the rate of timber production that can be sustained on a given land base;
- the age of the trees;
- the growth rate of the new forest that regenerates after logging;
- the utilization standards used — that is how much of the wood is deemed economically usable and must be brought out for processing;
- the need to preserve wildlife and fish habitat, sensitive soils, aesthetics, and other resource needs;
- the production capabilities and fibre requirements of the timber processing industries.

An important part of any AAC determination is a technical yield analysis. A yield analysis, in simple terms, looks at the size of the accessible and operable forested land and calculates the volume of wood that can be grown on the land based on a particular management regime. Currently, this volume is based on the length of time it takes for a stand to reach and maintain its maximum annual growth rate. While a tree might increase in volume (keep growing) for 300 years, its maximum annual growth rate occurs within the first 100 years or so.

Economically, it makes sense to harvest the trees near the end of this maximum annual growth rate, rather than wait another 200 years to get a little more total volume. The longer the rotation, or growth cycle, the lower the sustainable yield will be.

Figure 7 ANNUAL HARVEST LEVELS
COMPARED WITH AACs ON CROWN LANDS



AAC in 000,000 m³

Source:
Ministry of Forests Annual Report

1. Since 1980/81 tables are Volume committed

Harvest Level in 000,000 m³

Source:
Ministry of Forests Annual Report

2. Harvest level includes private land within TFLs, excludes firmwood rejects prior to 1981 & Timber licences outside TFLs

With these thoughts in mind, a yield calculation is made of the estimated volume of timber that can be harvested annually over time. This calculation balances the harvest of the current endowment of timber with the growth of future timber. The planning horizon used in making this calculation is usually 200 or more years.

The AAC determination is largely based on the yield analysis. Figure 7 illustrates for Crown lands the various provincial AACs and compares them with the actual harvest levels over the past 20 years.

The yield analysis process and resultant AAC determination are reviewed as a matter of policy every five years, however this policy has not been consistently applied, especially in the Timber Supply Areas (TSAs.)

The current timber endowment consists largely of "old growth" trees that have a greater volume of wood at harvest than will the "second growth" trees that replace them, under current management regimes. Those current timber management regimes and yield calculations are not designed to replace old growth inventories with an equal volume of wood. That means there could be a "falldown" of the inventory volume.

This does not necessarily imply that current harvest levels are not sustainable, but it has led to a perception that B.C.'s forests are being overcut. It also doesn't take into account the possibility that through intensive forest management the timber volume could actually be increased in some areas.

The real problem, the Forest Resources Commission has concluded, is that the information used to calculate these yield results is very unreliable. Yield analysis is often completed with an inconsistently defined estimate of the working forest area, outdated and unreliable inventory estimates of volume and production capacity, and growth and yield forecasts that do not reflect the actual growth rate of the forest. Given the uncertainties in the data base, technical deficiencies and the large number of assumptions used, the Forest Resources Commission has concluded there can be only limited confidence in the yield analysis results. In other words, it is possible that the AAC determination is too high. It is equally possible that the AAC determination is too low. There may be some circumstances where current information will indicate that a decrease or an increase in AAC can be supported. These should be acted upon.

The forest industry's wood quota in B.C. is based on the utilization of sawlogs rather than on a total wood fibre supply. As a consequence, the working forest area delineated for yield analysis comprises only the timber economically viable for sawmills. Wood that might be available for pulp and paper, or other uses, isn't part of the formula. As a result, significant timber volumes are excluded from the yield calculations. The "falldown" widely predicted when looking at mature forest harvesting in transition to managed forest harvesting may well never happen. There is no well defined management strategy to alleviate this falldown or to minimize the economic impacts.

Inventory data can reflect all wood fibre volumes — not just sawlogs. But the AAC is determined to harvest a volume of sawlogs. If the additional volume is included by altering the utilization standard to include those other volumes, then the AAC could be increased. In other words, the AAC can be changed in either direction simply by changing utilization standards, without any changes in the actual volume of standing timber.

A new, improved timber supply analysis process linked with improved inventories and growth and yield predictions will provide new opportunities to evaluate both the biological and economic opportunities for a sustainable fibre supply. The Forest Resources Commission is concerned that these opportunities are not being examined in the current yield analysis process. As a result, Allowable Annual Cut regulating policies may be exacerbating the wood supply issue. The potential to improve forest yields by silvicultural practices and the management of stand harvest cycles could be significant. This needs to be examined by yield analysis. Any adjustment to the AAC — in either direction — can't be justified until these deficiencies in the yield analysis process are rectified.

The Forest Resources Commission further believes that the yield analysis process is too inflexible. At present, the process results in an Allowable Annual Cut determination before the Timber Supply Area plan is developed. As a consequence the timber harvest goal is set without adequate consideration of the other forest management goals, and

the protection and enhancement of all other values could be compromised. It then becomes difficult to develop a Timber Supply Area plan that equally considers all the renewable forest resource values. The sheer size of the Timber Supply Area, which can include several Forest Districts, also creates difficulties. Smaller forest planning units based on the Forest District boundaries would be more manageable, and would conform with units to be used by Local Resource Planning Groups as described in the chapter on Land Use Planning. The Forest Resources Commission recommends that a Forest District Planning Committee be formed with the responsibility of preparing the forest management plan for each Forest District.

Using smaller units will also have a beneficial effect on determining AACs as it will project with greater reliability the sustainable harvest by unit. The Forest Resources Commission believes that determining AACs on the smaller supply block levels, and then adding them together will produce a far more accurate picture of feasible harvest supply from the forest than doing the reverse — that is determining the AAC for the TSA and then dividing the total by the supply block areas to produce the AACs for the smaller units. However, present harvesting levels might have to be reduced to reflect the forest composition and age class distribution on the smaller land units.

Both the yield analysis and the District Forest Management Plan need to be carried out as one planning process. Yield analysis can be used in an interactive process in developing the forest management goals for the Timber Supply Area.

The responsibility for completing the yield analysis process is currently shared between the local Timber Supply Area Committee and various branches of the Ministry of Forests. But divided responsibilities and different levels of authority cause lengthy delays, and a yield analysis can take five to seven years to complete. As a result, Timber Supply Area plans are rarely finished, are soon outdated, and are unresponsive to changes in the economy and market cycle.

Resource management opportunities need to be defined for each Forest District individually. The forest management plan needs to address a balance between these opportunities and the social values and costs at a local level within a provincially acceptable strategy.

The Forest District Planning Committee must be accountable for completing the yield analysis and preparing the District Forest Management Plan. Representation on the committee needs to be expanded to broaden public involvement. The Committee would have the authority to acquire the multi-disciplinary expertise required to prepare the forest management plan. To be effective strategically these plans must be prepared and updated every five years.

The yield analysis would be completed within the framework of some general principles and procedures. This would include a structure that is responsive to changes in strategies or assumptions. The Committee must develop a thorough understanding of the impact on short and long term wood supply of integrated resource use goals. It is also important that the management assumptions be monitored during the implementation of the forest management plan.

The Forest District Planning Committee should also have the responsibility for developing the Allowable Annual Cut recommendation. The Committee would solicit comments from all levels of the resource ministries and from the public. As a final step, the Committee would present to the Provincial Forester a recommended Allowable Annual Cut that has been developed by consensus.

The Forest Resources Commission recommends that:

87. **the Allowable Annual Cut of Timber Supply Areas or Tree Farm Licences not be raised or lowered until and unless new timber inventory data and subsequent yield analysis clearly justify an adjustment, except in those obvious cases where current information strongly support a change;**

88. **the Allowable Annual Cut for Timber Supply Areas and Tree Farm Licences be determined within the context of the forest management goals for all values on the management unit;**

89. **the yield analysis task be changed to become an integral part of the process of developing a forest management plan rather than used solely to determine Allowable Annual Cut;**

90. **Forest District Planning Committees be formed with the responsibility to prepare District Forest Management Plans. The representation must include technical specialists and the public;**

91. **the yield analysis task be decentralized and become the responsibility of the Forest District Planning Committee.**

4. Ministries and Agencies Responsible for Inventory Development

As outlined in the first section of this chapter, a wide variety of ministries and agencies are responsible for collecting inventory information for a number of forest resource uses, or uses that might affect the forest resources. The following is a brief description of those responsibilities.

- Sub-surface inventories of mineral, petroleum, natural gas and geothermal resources in the province are kept by the Ministry of Energy, Mines and Petroleum Resources. These consist mainly of computerized data bases and maps. This information becomes important when exploitation plans, such as petroleum exploration and production, potentially impact on the resources above the ground.
- The Ministry of Forests maintains a timber inventory of all the Crown forest land in the province, as well as a rangeland capability inventory. An inventory of recreation potential has also been completed and the Ministry is currently focusing on identifying wilderness values.
- The Ministry of Crown Lands maintains the Crown Land Registry Information System and is the lead agency for the development of a

provincial information strategy. The Ministry has several resource inventories on the capability of Crown land for various uses which were compiled for specific Land Use Plans or studies.

- The Ministry of Environment has extensive map inventories and data bases for numerous resource values. These include lake inventories, river and stream inventories, wildlife population, critical fish and wildlife habitat mapping, water quality sampling, biophysical habitat, a network of snow survey stations, stream flow stations, soils data base, climate data base, vegetation data base and flood plain mapping. The level of detail and information has depended on how critical the management need is. For example, wildlife inventory has been concentrated on ungulates as they are important game species.
- The Ministry of Parks keeps resource inventories, such as wildlife populations and vegetation mapping of Provincial Parks, for planning and management purposes.
- The Ministry of Tourism keeps a rudimentary province-wide tourism resource inventory and will inventory tourism values in areas where land use conflict occurs.
- The Ministry of Transportation and Highways maintains records and maps of the provincial highways network.
- The Ministry of Municipal Affairs, Recreation and Culture maintains a record of archeological sites and is initiating an historical resources data base. No inventory of cultural values on forest land exists.
- The Ministry of Native Affairs has information pertaining to Indian Reserves and to Native land claims.
- The Royal B.C. Museum makes and maintains inventories of animals and plants in areas throughout the province, including potential parks, ecological reserves and areas of biological significance.
- The B.C. Assessment Authority keeps information on timber inventory and soils of private forest land for preparing property assessments.
- B.C. Hydro has information concerning reservoirs and transmission line corridors in the province.
- B.C. Rail has information relating to rail routes throughout the province.
- The Ministry of Agriculture and Fisheries has completed a coastal biophysical inventory for marine finfish for the South Coast. The Agricultural Land Commission has inventories of soil type, cover and land use within the ALRs.
- The Federal Department of Fisheries and Oceans maintains an inventory of the anadromous fish resource and habitat. The Water Survey of Canada manages the jointly funded federal-provincial stream flow network program.
- The Federal Department of Indian and Northern Affairs has information concerning Indian Reserves and Native land claims.

8. FOREST PRACTICES

1. Introduction

The clash between the traditional economic values of resource development and the new, much broader values is most evident in public attitudes towards timber harvesting and other related forestry practices. By far the most visible component of industrial forestry, timber harvesting techniques have become the symbol of what many British Columbians feel is wrong with current forest management systems.

Obviously, when a forested area is clearcut (a harvesting technique that involves removing all the trees in a given area) the change is immediate and dramatic. Even the most ardent supporters of the practice of clearcutting will readily concede that, at least for the first few years, it doesn't look pretty. As a result, the debate over harvesting techniques has often become quite emotional, with many concerned people calling for an outright ban on clearcut harvesting, and its replacement by other, less visually intrusive harvesting techniques.

In coastal regions, harvesting techniques were historically based on technical and economic criteria, rather than on ecological, silvicultural and aesthetic criteria. Harvesting policies and philosophies have been kept separate from forest management policies and philosophies. As a result, management for other values — now considered important by society — was not actively considered until after the harvesting activities had already taken place. Within the last 20 years, the situation has improved, and steps have been taken to require consideration of other values before harvesting plans are approved. In the Interior, harvesting and forest management have always been more closely coordinated than on the coast. Nevertheless, there is still much more to be done in both regions.

As the enhancement of all forest values through the practice of Land Use Planning, renewable resource management, and tenure allocations all require a coordinated approach, so too, does the practice of determining timber harvesting techniques. The Forest Resources Commission has heard wide-spread concerns that values are being lost or not considered within a centralized, administrative forestry whose main concern is timber production. An ecologically sound and socially responsive forestry is now required. This chapter examines ways of ensuring that socially responsive forestry is practiced.

2. The Need for Established Practices

Much of the public's confusion over what is or isn't good forestry can be traced to the fact that there is no universal code of practice that covers all the aspects of harvesting and silviculture. It is there in pieces. The Forest Act requires "environmentally sound practices," but does not spell it out in sufficient detail. The

Professional Foresters Act establishes standards for the conduct of foresters, but specifically precludes them from having any authority over timber harvesting and road construction. The requirements and standards of the recently-introduced Pre-harvest Silvicultural Prescription (PHSP) perhaps come closest, but are site-specific rather than general. There is a need for a single code that governs all the elements of good forest management, such as:

- the choice of clearcutting or selection logging as a harvesting system within the silvicultural prescription.
- the size, distribution and timing of clear cuts.
- approaches to be taken during harvesting to consider a wide range of other values, such as water in community watersheds, estuaries, streams and lakes; wildlife habitat and migration corridors; areas of high visual or recreational value; special soils or soil cover areas; slope instability.

The Forest Resources Commission has concluded that while many of these standards exist in different parts of different statutes, it would be valuable to amalgamate them in one code of practices. The general provisions of this code should recognize the need for site-specific determinations of actual procedures. A new, stand-alone Forest Practices Act is the appropriate mechanism for this amalgamation.

Development of a single code of practice will establish a minimum standard of forest management essential to the Vision Statement's goal of enhanced stewardship. It will also provide a clear standard by which the performance of forest managers can be measured through the independent audit process (outlined in the chapter on tenures.)

The Forest Resources Commission recommends that:

92. A single, all-encompassing code of forest practices be established through the introduction of a Forest Practices Act.

3. Biological Diversity

The Forest Resources Commission heard many concerns about the impact of clearcut harvesting and the subsequent replanting of harvested areas with one or a few types of tree species. Such practices, it was argued by some, reduce biological diversity, create 'monocultures,' and increase susceptibility to disease or insect attacks. Perhaps more than any other environmental issue, the threat of loss of biological diversity, especially that caused by deforestation in the tropics, has fired the public's imagination. It is important to separate the fact from the emotion in this debate.

British Columbia has one of the most ecologically-diverse landscapes in the world. It includes greater ecological diversity than many areas that are significantly larger. More than two thirds and perhaps as much as three quarters of all the ecological diversity in Canada is represented in B.C. Four out of the five major types of world climate are

represented in the province with a corresponding diversity of vegetation that varies from arctic and alpine tundra to broad-leaved evergreen and deciduous semi-Mediterranean vegetation, and from semi-arid/semi-desert grasslands to temperate rain forest. Within each of the major climatic belts there are climatic variations great enough to result in significant ecological variation. These are called biogeoclimatic zones.

Timber harvesting in British Columbia has been unfairly equated with deforestation in the tropics. Global concern about reduced biodiversity in the tropics is likewise applied to the forests of our province. The comparison is an unfortunate one, if for no other reason than that land in the tropics is being cleared for agricultural purposes, while B.C. forested land is systematically replanted after harvest. In view of the wide-ranging opinions on this topic, the Commission believes it is important to provide a basic understanding of what biodiversity is in the B.C. context.

In British Columbia, tree species diversity varies greatly from one part of the province to another. While B.C. has a lot of different ecosystems in its different regions, the biodiversity of each ecosystem in itself is relatively low by world standards. While those statements are related to trees, the biodiversity of other plant, animal and insect life generally corresponds to the number of tree species.

Different plant and animal species are found in different stages of any particular ecosystem type. Each plant species has its own particular soil and climatic (including microclimatic) requirements and tolerances. Each species of animal has its own habitat requirements (largely, though not solely, a function of the plant community), and will, therefore, react uniquely to any man-made or natural disturbance. In considering the ecological constraints on harvesting methods and frequency, the forest manager must evaluate the successive stages of change that will be caused by logging and silvicultural activities.

The patterns of change in all types of plant, animal and insect life are as varied as the ecosystems on which they take place and are affected by the different types, frequencies and intensities of disturbance. No generalization about biological diversity is accurate for more than one or two biogeoclimatic zones, and sometimes won't apply even to different areas within one biogeoclimatic zone.

Ecosystems are complex and dynamic. The life forms they contain are highly variable, both with time and from site to site. Components (like the soil) that determine which plants can grow are less variable over time, and less affected by man-made or natural disturbance. Therefore, the same kinds of plants will usually grow back after a disturbance, unless the climate changes dramatically or the soil make-up changes dramatically. However, we judge the recovery of the ecosystem back to its full potential by the variety of life forms that come back. To understand the impact of timber harvesting, we must understand the degree to which the physical and chemical conditions of the particular ecosystem have been altered, and the extent to which its ability to fully recover has been changed.

4. The Tree Crop Production Cycle: Silvicultural Systems

Timber harvesting, regardless of the technique employed, cannot be viewed in isolation. In a managed forest, it is one component of a growing cycle that spans between 60 and 120 years. As the forest matures from seedling to full-grown tree, a number of silvicultural treatments are applied to generate the best possible mix of tree species and maximize the biological growth rates. All these components are interrelated, and the harvesting technique ultimately selected will be governed by these many factors.

To suggest, therefore, that any particular harvesting system is all good, or all bad, fails to take into account these many interdependent factors. Harvesting systems must be selected after consideration of all these factors and modified to take into account many other variables, including the non-commercial values society now feels are important.

Tree crops can be grown under one of two major types of silvicultural system: even-aged and uneven-aged. In an even-aged, managed forest there is a final harvest in which all or most of the trees are removed. Whether or not the new trees are planted, regenerate naturally, or are a combination of the two, they will all grow at approximately the same rate, and mature at about the same time. They are all harvested and the cycle starts all over again. In an uneven-aged managed forest, only the large, mature trees are harvested, leaving smaller trees to continue growing. This is not to be confused with highgrading, in which only the best specimens are taken while weaker, inferior trees are left behind. There is always a significant forest canopy, harvesting takes place more frequently, and there is always a mix of old and young trees.

Each system has its advantages and disadvantages, and each system is appropriate given the right circumstances. Traditional uneven-aged management may be appropriate for shade-tolerant tree species, for protection forests, in hot, dry climates, for some sub-alpine forests, for forests in which frost creates regeneration problems, or for areas where certain wildlife, watershed, recreation, soil, or other values require a permanent forest cover. Traditional even-aged management is generally more appropriate for tree species that need full sun, for forests with moderate climates or cold soils, and in situations in which it is undesirable to have harvesting equipment entering the forest too frequently because of soil compaction, damage to tree roots, and accompanying insect, disease and wood damage problems. It is also beneficial for wildlife adapted to prosper in disturbed ecosystems, whether the disturbances are man-made through harvesting or occur naturally from forest fires, wind storms, etc.

Research in Western Oregon has identified new silvicultural systems that do not fit neatly into the traditional even-aged vs. uneven-aged dichotomy. This "New Forestry" attempts to incorporate silviculture with the other ecological and social values in the forests.

New Forestry attempts to conduct timber harvesting in a manner that preserves and enhances values such as water, energy and nutrient cycles. For instance, where

traditionally large organic debris has been removed from the forest floor after harvesting, the New Forestry recognizes the value of this debris for water retention and erosion control, as well as its role in the nutrient cycle. Similarly, large dead trees and snags that were removed as a worker safety consideration, are left standing for cavity nesting birds and wildlife.

Critics of New Forestry point out that the smaller, more dispersed clearcuts need a much larger forest area to support the same volume of harvest. That, in turn, necessitates much longer road systems, which pose their own particular set of environmental problems. Other disadvantages include the cost of repeated entry for harvesting, the acceleration of tree loss from windfall, proliferation of insect infestations and diseases such as mistletoe, susceptibility to forest fires, brush buildup, and safety hazards from snag trees left standing.

Throughout this report, the Forest Resources Commission has recognized the need for managing the forests for all values and the need for an ecological basis for forest harvesting practices. The Commission believes that substantial research, both in universities and in the field, must be undertaken to develop or refine appropriate silvicultural systems across British Columbia.

Even-aged Management

A site with all the trees removed — either from clearcut harvesting, wind, fire, or other natural causes — is regenerated, either naturally or by planting seedlings. "Pioneer" species such as lodgepole pine self-regenerate readily after clearcut logging or wildfire. Natural regeneration can be used if, in harvesting the original mature forest with care, seedlings and saplings are already established in sufficient quantities. Alternatively, a scattering of 'seed trees' may be left standing to regenerate the site naturally.

Natural regeneration is susceptible to seed predation, weed competition, bad seed years, and other factors that may cause regeneration to fail. Therefore, there has been an increasing dependence on the planting of nursery-grown seedlings. Planting also allows foresters to change or add tree species, establish 'genetically-improved' seedlings of the same species, and use harvesting methods that mitigate against natural regeneration. Much of the recent planting has been to reforest 'not satisfactorily re-stocked' (NSR) areas where plantations or natural regeneration failed in the past.

Until the new trees have grown taller than competing types of vegetation, weed control may be necessary. Once the new tree crop is well established, it should be 'spaced' in much the same manner as a gardener might space a carrot crop. The remaining trees grow more rapidly. The number of trees that constitute 'adequate stocking' varies greatly as a function of stand age, ecosystem type, and species (e.g. 400 trees per hectare are adequate in a young ponderosa pine forest, but 1500-1800 trees per hectare are needed in a young lodgepole pine forest in the Southern Interior.)

As the trees continue to grow, the smaller ones will begin to wither as their healthier, stronger companions shade them. In order to further stimulate the growth of the stronger trees, the smaller ones can be harvested in a commercial "thinning" program — providing a small volume of wood for processing and space to grow for the remaining trees.

The final clearcut harvest removes the present crop and prepares the site for regeneration. All final harvesting should be designed with the regeneration needs in mind. In fact, harvesting now cannot proceed until a regeneration plan, called a Pre-harvest Silvicultural Prescription (PHSP), has been prepared and approved. This document, mandatory under the terms of the Forest Act, must be completed for every area that is to be harvested. It includes a recommendation about the type of equipment that should and should not be used, the type of site preparation treatments that are to be applied, and the method of reforestation, including natural regeneration or planting, the species and type of seedling for planting, and the spacing and stand maintenance activities that should be undertaken.

Uneven-aged Management

Uneven-aged management attempts to maintain the full range of desired tree age classes over relatively small areas. There is always a forest cover of some size and scope, as the trees are never all harvested at once.

There are several different silvicultural systems for managing an unevenaged forest:

a. Single tree selection system: individual large trees are harvested and smaller trees are cut in a manner that maintains a desired age and size-class distribution and structure in the stand.

b. Group selection system: small groups of trees that are similar in size and age are removed at one time, creating small patches of even-aged regeneration.

c. Shelterwood system: multi-storied systems in which the forest may have two or more distinct crown levels representing two or more age classes of trees, rather than a mixture of all age classes.

There are significant benefits to using selection harvesting techniques. The forest maintains an appealing visual appearance over the entire cycle of growth and harvesting. Wildlife habitat conditions remain fairly stable over time, benefiting species of animals that are favoured by continuous cover of multi-storied forest. It is a good system for very small forest units because a small supply of logs can be harvested continuously, rather than intermittently. Additional harvesting costs can be offset by lower site preparation and planting costs. Snow melt is easier to regulate. Biological diversity doesn't fluctuate as much in the short term.

But stacked up against these significant advantages are some equally significant disadvantages. Harvesting operations take place much more frequently, leading to a

wide range of environmental impacts on the whole ecosystem. Damage is done to the roots and stems of the trees left standing by the frequent movement of equipment. That damage leads to root rot, increased susceptibility to windfall, and stem decay. The higher frequency of harvesting activities can damage the soils, leading to soil compaction on fine-textured materials, and gully erosion on steeper slopes. More roads are needed, and on some steep hills they may take up a substantial portion of the site. The lower volume of logs removed at each harvest will generally increase the cost of harvest per cubic metre.

The Choice of System

If forest management is to be successful, the harvesting and silvicultural systems used must be fully integrated and ecologically sound. They must also be based on the needs of the full cycle or rotation of the forest — and not on short-term considerations, whether they be economic or aesthetic. Selection logging techniques used in Sweden's spruce and pine forests in the first half of this century led to a significant degradation of the commercial forest. It has been called the "green delusion" — an aesthetically pleasing forest with rates of growth significantly below those in forests that had been clearcut and fully replanted. The Swedish government responded by making clearcut harvesting techniques mandatory for the final harvest.

The Forest Resources Commission has concluded that in most of B.C.'s commercial forests, silvicultural considerations alone will point to clearcut harvesting techniques on even-aged stands as the most ecologically sound. As has been the experience in Sweden, selection harvesting in uneven-aged forests at cold northern latitudes does not result in a healthy, productive forest. Nevertheless, selection harvesting is an appropriate system in some Interior dry-belt regions.

Whichever harvesting and silvicultural system is used, forest management must reflect the physical condition and soils of the particular site, the ecological requirements of the forest plants that are to be grown, and the habitat requirements of a broad spectrum of animal and microbial species. These factors will determine the choice of the harvesting system. If a clearcut system is chosen, it will also determine the size of the clearcut. The clearcuts will be further modified by other, non-ecological factors such as aesthetic values. In addition, harvesting systems in forests that surround parks, wilderness areas, and ecological reserves should be given special site-specific attention. The harvesting and silvicultural system used in B.C. is now required by law to be decided prior to harvesting decisions on the basis of an ecologically-based pre-harvest site assessment. This should lead to a reduction in the number of conflicts caused by timber harvesting in the future.

The Forest Resources Commission recommends that:

93. timber harvesting should be conducted in an ecologically sound manner;

94. the choice of forest harvesting system reflect the physical

and biological capabilities of the site, the requirements of the trees that are to be grown, as well as the impact upon other forest values through time;

95. **if even-aged management is the silvicultural prescription, the site and site condition should determine the size and dispersion of clearcuts. These, in turn, should be modified by the consideration of other non-ecological factors such as aesthetic values;**

96. **the rate of harvesting must be designed to retain local and regional biodiversity throughout the rotation and reflect the management goals for all values.**

5. Forest Roads and the Environmental Impact of Harvesting

While much of the blame for environmental degradation in timber harvesting is placed on harvesting techniques, in fact many of the environmental problems are related to the access roads. An intimate part of any harvesting system, a road network is equally important for forest renewal and forest protection. It also provides many benefits for some kinds of forest recreation.

The major haul roads are generally well built and maintained. Unfortunately, secondary roads, spur roads, and other temporary roads have sometimes been poorly constructed, poorly located, poorly drained with inadequate culverts, poorly maintained, and poorly 'put to bed' for the period of several decades between their use for silvicultural or other management activities.

In the past, the high cost of roads and the risk of windstorms blowing down remaining trees encouraged the practice of 'progressive' clearcutting. In this practice, new clearcuts were created adjacent to the previous clearcut, ultimately creating one large clearcut. This practice kept road costs down, minimized the environmental impact of roads, and reduced the number of trees susceptible to windthrow. But progressive clearcutting can be aesthetically unattractive and cause wildlife problems. In some climates and with some forest types it can create difficulties in natural tree regeneration and alter river flows and fish habitat. If the clearcuts are small and elongated, progressive clearcutting is no different from strip clearcutting. This is a widely used and well respected silvicultural system in Europe.

In the early 1970s, progressive clearcutting on the coast was stopped and replaced with a system in which only 50 per cent to 60 per cent of a valley would be logged in pieces on the 'first pass.' Once the new trees in the cut areas have matured to the point where the land once again looks forested, the remaining areas may be harvested, subject to constraints for wildlife or other resources. More rapid removal of these remaining stands may be permitted in case of windthrow, fire, or insect attacks. If the "green-up" period is short, a valley may look much the same after the second or third 'logging pass'

as it would at the same time after a progressive clearcutting system, and the effects on other resource values may be similar. Where the green-up period is long, causing the different logging passes to be spread over much of the rotation, the area will have a mosaic of different aged stands.

A significant number of people and groups have argued that clearcut logging techniques should be replaced with selection logging, where only some of the trees are harvested in any one operation. While the forest canopy might look better, selection logging techniques require more and longer roads with their associated environmental risk. There is also an increased risk of site and environmental damage — particularly in steep mountainous terrain where up to a third of the site may be occupied by skidroads. In contrast, clearcutting with cable yarding may require only a small percentage of the area in roads.

The Forest Resources Commission has concluded that, in many cases, environmental damage is caused more by improper road construction and maintenance than by any particular harvesting technique. Therefore, increased emphasis should be given to long-reach cable systems or other systems that minimize the length of road required.

Roads constructed initially for timber harvesting become access roads for other users of the forests. Integrated resource management plans should pay particular attention to the impact on other forest values of increased access. Certain wildlife species and environmentally-sensitive ecological systems may not be able to tolerate significant increases in numbers of people. The choice of timber harvesting system in areas adjacent to sensitive wildlife or ecological systems should emphasize the shortest road system possible, and these roads should be reclaimed following harvesting and replanting.

The Forest Resources Commission recommends that:

97. increased emphasis be given to harvesting systems that minimize the number and length of forest roads;

98. increased emphasis be given to other resource access management in planning forest roads;

99. where access provided by logging roads endangers environmentally-sensitive areas or wildlife habitats, these roads should be reclaimed.

9. EDUCATION

1. Introduction

The Forest Resources Commission has recommended the establishment of an integrated management system for B.C.'s forest resources — from Land Use Planning through a new Ministry of Renewable Natural Resources, through changes in tenure rights and the way forest management is financed. Those who work in forest-related industries and services must be well trained and possess a thorough understanding of the role they play in that system. Public involvement must be comprehensive at all stages in the system, and effective public involvement demands an informed public.

The key to the smooth operation of this new system and the corresponding enhanced stewardship promised in the vision statement, is education. At all levels — from public education at the primary, intermediate, and graduate levels, through job training, through advanced education in colleges and universities — the value of the resource requires a thorough understanding of the issues involved and the choices that must be made.

From the comments and questions of virtually everyone who appeared before the Commission, it is clear that much more must be done in the field of education. The interest shown in this topic was so compelling that the Commission made public education recommendations in its July 1990 Interim Report.

2. Public School Curriculum

A large number of people and advocacy groups at the Forest Resources Commission's many public meetings expressed concern about the lack of course work and teaching materials related to forest ecosystems and various forest management practices. There was general consensus that the social, environmental and economic importance of British Columbia's forests is not being reflected in the public school curriculum. In its Interim Report, the Commission stated:

"...the Commission believes that greater emphasis is needed in the curriculum throughout the primary, intermediate and graduation years on the overall importance of the resource industries, particularly the forests, to the social structure and to the economy of the Province.

"The Commission believes that the educated public of this Province should understand the importance of our forest industries in shaping the Province, in maintaining certain communities, in providing for services such as health and education, and generally in helping to maintain a lifestyle unequalled in most areas of the world.

"The public should also have a better understanding of forest practices, why they are used and what their effects are."

Accordingly, the Forest Resources Commission recommended that:

The Ministry of Education be directed to include significant information about the importance of the resource industries to the Province of British Columbia, particularly the forest resource, and to include accurate balanced material about forest management practices at all levels of the curriculum.

The Forest Resources Commission is pleased to note that the recommendation put forward in the Interim Report and restated above was immediately accepted and is being acted upon by the Ministry of Education. Efforts to develop a thorough and balanced public school forestry curriculum have been initiated and are ongoing. The Commission wishes to emphasize that the curriculum it envisages will lead to a balanced understanding of the economic, environmental, and social importance of all renewable resource values.

A Ministry of Education response to this recommendation is attached to this report in the Appendices.

3. Public Information

Expanded formal education programs will deal with the need for good student and professional training through appropriate curriculum, but will have little effect on the general public. Throughout this report, the Commission is calling for a greatly increased role for the public in all forest management issues — from Land Use Planning down through specific resource decisions. An informed public is essential to the success of public participation.

Both government and industry are currently operating a variety of public information programs designed to give average people a better understanding of the forest management issues society faces. These programs include conducted tours of mills, forest operations, and demonstration forests, as well as publication of brochures, pamphlets, etc.

These types of programs provide a valuable source of factual information for the public. They also provide an opportunity for the public to get "first hand" information from foresters and other professionals in a cooperative environment. In view of the increase in the level of public participation in Land Use Planning and forest management, the Commission believes that both industry and government should expand these programs wherever possible.

The Forest Resources Commission recommends that:

100. public information and education programs conducted by all forest user groups be expanded wherever possible.

4. Certification of Forest Workers

The best system in the world is worthless without the skill and dedication of the men and women in the field who must, on a day-to-day basis, carry out the multi-faceted policies determined to be in the best public interest. Ultimately, success in achieving the goals of the Vision Statement will depend upon the skills, experience and understanding of those who work in the forests.

With that in mind, the Forest Resources Commission asked government, industry and environmental organizations to cite specific examples of good and poor harvesting practices across the province. Commission members then visited these sites to see firsthand what is good and what is bad about current forest management practices. We saw a large number of good forestry practices and many thriving new forests. We also saw many examples of poorly executed harvesting systems, use of the wrong system, poor practices on the sites themselves, and areas where the forest had not been properly regenerated. For example: some forests were "highgraded," where the best and biggest trees were cut leaving behind the inferior trees and a thoroughly degraded forest; flat valley bottoms were clearcut, leading to a rise in water table that reduced the capacity to support another crop of trees; and finally, roads were improperly constructed, landing areas were too large, and improper use of heavy machinery compacted the soil and led ultimately to excessive erosion.

The majority of problems associated with harvesting systems are now being addressed by the Pre-harvest Silviculture Prescription (PHSP) — which is essentially a comprehensive plan that must be approved before any harvesting can take place. But poor practices caused by lack of knowledge and understanding at the field level can defeat the best plans and systems. In British Columbia we are well beyond the point where "learning on the job" in the absence of formal training and apprenticeship programs is an acceptable training technique. Thorough and intensive training must take place before workers are placed in the field.

The Forest Resources Commission considered an option of proposing that all forest workers be required to undertake training in forest management and timber harvesting practices, as well as forest ecology. The program would lead to certification prior to their being allowed to work in the forests.

However, the Commission ultimately concluded that rather than impose yet another level of regulation on the forest industry, it should leave the responsibility for proper training and accreditation with the industry. This can take many forms, including the more extensive use of apprenticeship systems. Forest tenure holders will be obliged to manage the forests for a full range of values. Their management practices will be subject to audit, and failure to pass these performance audits could lead to loss of tenure. It will be in their own best interests to ensure that the security of their tenure is not jeopardized by improper practices or poor worker training.

Nevertheless, the Forest Resources Commission has concluded that government, industry and labour organizations should begin to develop voluntarily forest training

guides and educational materials that would be broadly distributed and available to new forest workers. Eventually an industry-wide educational standard and a voluntary industry certification program could be established.

The Forest Resources Commission plans to monitor the progress that is being made in introducing a voluntary industry program and prepare subsequent reports.

The Forest Resources Commission recommends that:

101. government, in cooperation with industry and labor organizations, develop a voluntary training program for forest workers that will eventually lead to certification and become a standard for forestry employment.

5. Technical and Professional Education

Enhanced stewardship of the forest resources has been a constant theme throughout this report. A Land Use Plan has been proposed that will permit an evaluation of the capabilities of the province's land base to attain social goals and retain important forest values. A management and financial structure was detailed that will ensure that the full range of values is reflected in forest management, and will provide the financial structure and commitment to achieve those management goals. A forest tenure structure was developed that would provide greater security and incentives to existing tenure holders. As well, it would increase the diversity of tenures and management practices in the forests while making management performance a condition of retaining tenure.

All this will require a major expansion and change in direction in the approach to technical and professional training. Technical and professional graduates will need a much broader range of skills and knowledge than they are currently being given. Existing professionals will need to upgrade their skills. All this will place a tremendous strain on both the existing core of professionals in a number of fields, and on the teaching institutions and the curriculum they offer.

The development of land capability information, new resource inventories, intensive silviculture and a better understanding of the inter-relationship of the various forest values under intensive, integrated resource management will require a new diversity of resource managers and resource management skills.

The Forest Resources Commission believes that as the emphasis is broadened on forest resource education at the public education level, so too, must it be broadened at the technical and professional level. Just as forest management must become multi-disciplinary in approach, the training programs for tomorrow's forest managers must be complementary and coordinated.

It is equally important that services and facilities be available in the various regions of the province, as there is already a strong demand for local access. Students want to be able to continue their studies beyond the secondary school level without having to move to Vancouver or Victoria.

Three provincial colleges have already committed to offering first year degree credit programs that are acceptable to the University of British Columbia's Faculty of Forestry. Four colleges offer diploma programs in forest technology, and the British Columbia Institute of Technology has a natural resource management program. Simon Fraser University offers a graduate program in natural resource management through the School of Resource and Environmental Management.

The Forest Resources Commission concluded that college and technical school resource management courses will need to be expanded to meet future demands, and must be broadened to reflect integrated resource management objectives and skill requirements. A high degree of cooperation and coordination between college and university programs should be encouraged. Expansion of the availability of transferable university credit forestry course work to more colleges and to second year course work should be a goal.

The emphasis on integrated resource management, and the resolution of conflicts over resource use, will create a strong demand for people with specialized resource management skills. As competition for limited resources continues to expand, more skilled negotiators and mediators will be needed. The Forest Resources Commission is of the view that the training of mediators and the development of a conflict resolution process must be initiated.

The Forest Resources Commission also heard a great deal of support for a new Forest Resources Management Faculty at the new University of Northern British Columbia. Concerns were raised that a new faculty would draw down funding for the forestry faculty at the University of British Columbia, and that there might not be sufficient employment opportunities for graduates of both schools. The Commission believes that the integrated, intensive forest management envisioned in this report will require many more professional resource managers with a broader range of skills than we currently have, particularly in the Interior. B.C. will need university trained resource managers in the same numbers, proportionally, as are currently working in those areas of the world where intensive management is now practised.

TABLE 10
University Trained Foresters - International Comparison

Region	Estimated Hectares/Forester
United Kingdom	2,900
Norway	14,000
Sweden	17,000
United Sates	17,000
Canada	128,000
British Columbia	
Coast	9,000
Southern Interior	24,000
Northern Interior	54,000

The Forest Resources Commission believes that a new Faculty of Forest Resource Management could develop its own forestry degree program with its own forest management specialization. The Northern Faculty of Forestry Committee, in its September, 1989 report, recommended three major components for the new faculty:

"The faculty will produce high quality field foresters with a solid grounding in integrated resource management together with communication and business skills.

"The faculty will be a centre of excellence in the management of forests of northwestern Canada combining under-graduate and graduate studies, upgrading for technical school graduates, continuing education for practicing professional foresters, and basic and applied research;

"The faculty will be intimately linked to the forest community in all its endeavors, through faculty and student interaction with government, industry and interest groups."

The Commission believes the recommendations of the Northern Faculty of Forestry Committee represent a good blueprint for the development of the faculty.

As mentioned earlier, the Forest Resources Commission believes that a strong demand for a broad variety of forest management skills and expertise will evolve from the recommendations of this report. A high degree of cooperation between the existing university forestry and resource management programs and the proposed Faculty of Forest Resource Management should be encouraged.

The Forest Resources Commission recommends that:

102. the availability of university level credit courses in forestry be extended to more regional colleges and be expanded to include both first and second year level courses;

103. a Faculty of Forest Resource Management be established at the new University of Northern British Columbia;

104. the training of mediators and the development of a conflict resolution process be initiated;

105. the training of professional forest managers be expanded to include a broader range of skills, including more environmental training and training in public participation and conflict resolution techniques.

6. Research and Development

The Forest Resources Commission's recommendation for a comprehensive new approach to forest resource management is based, in part, on a firm belief that there is much more to be learned about the complex ecosystems of the forests. As our knowledge base grows, so does our ability to manage effectively the many resources and values the forests represent. The same can be said of the potential for developing new products or processing techniques to extract the most value from the wood that is ultimately harvested.

That knowledge can come only from research and development. The Forest Resources Commission believes it is imperative that the continuing development of the graduate program of the Faculty of Forestry at U.B.C. as a centre of excellence must be supported. The proposal for a Centre for Applied Conservation Biology, under U.B.C.'s Faculty of Forestry, is exactly the kind of program the Commission has in mind. Research is also needed in areas such as:

a. Developing growth and yield information for all varieties of trees in managed stands all over the province. This information is vital for determining how many trees can be harvested at what optimum age.

b. Determining what techniques to use to manage a stand of trees for old growth characteristics.

c. Learning the impact of various silvicultural systems — harvesting, planting, etc. — on other forest values such as water, fish habitat, recreation, etc.

d. Estimating the contribution to the diversification and stability of the provincial economy of such forest uses as tourism, recreation, hunting, guiding, etc.

e. Discovering the implications of various forest management practices on such things as employment and community stability.

The rapid growth of much of British Columbia's forest product manufacturing was based upon a relatively narrow range of "commodity" products — market pulp, paper, newsprint, and dimension lumber. While some companies have used the financial strength developed from these product lines to conduct long-term research into the development of higher value products, the majority have not. As a result, research and development in B.C.'s forest products industry is still quite low by world standards. And because many B.C. forest companies are foreign-owned, much of their research is done outside B.C.

A surge in the expansion of specialty products manufacturers in recent years is a reflection, in part, of the availability of forest licence allocations under the Small Business Forest Enterprise Program and opportunities to fill niche markets in areas such as Europe and Asia.

The Forest Resources Commission believes that opportunities for expansion and diversification in specialty product manufacturing will grow as its proposals for woodlot licences, community forests, and an expanded log market are introduced. The fibre resource will be allocated to its highest and best use, increasing the returns to the forest and to the public owners of the resource. But it will need some help. Perhaps the most pressing problem faced by the small business manufacturing sector is a lack of information related to foreign market demands. While this type of information is readily available for standard forest product commodities, it isn't available for specialty products. The lack of such information will inhibit opportunities for small scale projects across the province.

Governments and industry associations are best suited to generate this kind of international trade information. The Commission believes the development of an up-to-date data base should be a priority.

The Forest Resources Commission recommends that:

106. continued support be given to the development of the Faculty of Forestry at U.B.C. as a centre of excellence in forestry;

107. major efforts be undertaken by governments and industry associations to expand the market and product specification information available to the developing secondary manufacturing industry in the wood products sector.

10. PUBLIC PARTICIPATION IN FOREST PLANNING AND MANAGEMENT

1. Introduction

The evolution of democracy has seen an interesting divergence in the concepts of participatory democracy and representative democracy. Simple "town meeting" styles of government — where all electors gather together and vote on the issues of the day — became too cumbersome and inefficient as societies grew in size and complexity. Representative governments evolved, asking for formalized elector input only once every number of years in the form of an election. As a result, the democratic decision making process of government has, over time, moved further and further away from the people being governed.

In keeping with this trend, the various government ministries and departments established to carry out policies enacted by parliaments and legislative assemblies also became further removed — concentrating on the elected government representatives above them rather than the people they were in fact serving. Ultimately, there were few formal processes that allowed people to be directly involved in the decision-making that affected them.

In the last decade or two, however, the trend has reversed. People are becoming more interested in the issues that affect them and their society, and they want the kind of direct involvement that "town meeting" democracy once offered. Differences of public opinion are sharp, and they occur frequently. People are no longer satisfied with a system of decision making that provides formal input only at the ballot box. The increasing complexity of society and the issues it deals with makes a complete return to simpler forms of democracy impossible. The challenge, therefore, is to devise a system of public participation that fits into the more complex, representative style of government now needed to run a complex society.

Nowhere is the demand for direct involvement more vivid, nor the challenge more pronounced, than in forest management issues.

The Forest Resources Commission was specifically asked to "recommend ways to improve public participation in forest planning and management." The Commission is impressed with the depth of public interest and concern on this issue, and the desire of all concerned to develop timely and efficient mechanisms that will avoid future conflicts.

The history of public involvement in forest planning and management in British Columbia is very brief. Public participation has been tacked on to a forest management system which reflected that earlier trend towards a reliance on decision-making by elected representatives and administrators, with little thought for public involvement. As a result, very little is enshrined in legislation, and most of what has been introduced

is in the form of broadly-worded policies and regulations for specific functions. Even at this late date, the only precise references to public participation in forest management issues are in Sections 27(2) and 34(3) of the Forest Act, which state:

> **27(2) — "The Minister shall not enter into a tree farm licence under this section unless he advertises as provided in subsection (1) and a public hearing is held on the applications."**

> **34(3) — "The Minister shall not enter into a Pulpwood Agreement under this section unless he advertises as provided in subsection (2) and a public hearing is held on the application."**

The only reference in the legislation to a general requirement of public participation in the planning process of the Ministry of Forests is found in section 4 (c) of the Ministry of Forests Act which states:

> **"The purposes and functions of the Forest Service are, under the direction of the Minister, to...**
>
> **(c) plan the use of the forest and range resources of the Crown, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated, in consultation and cooperation with other ministries and agencies of the Crown and with the private sector " (BC MoF 1978b.)**

The "private sector" is interpreted by the Ministry to include the public.

In 1980, the Ministry of Forests hired its first Public Involvement Coordinator and began actively promoting its public involvement program. A public involvement handbook was published in 1981 to guide Ministry staff in conducting public participation programs. A 1984 resource planning manual laid out the basis of public involvement activities in the Ministry of Forests.

In summary, there is no single comprehensive document that defines the roles of participants, the decision criteria employed and the process of public involvement in planning and management.

In the absence of much home-grown information or experience, the Forest Resources Commission asked Simon Fraser University's Natural Resources Management Program and the University of British Columbia's Forest Economics and Policy Analysis Research Unit to study this issue. This wide ranging study examined topics such as: public involvement in other provinces and other countries, methods of making land use decisions, evaluation techniques for planning purposes, and the present Crown land allocation and management planning process in B.C. The study team also provided an evaluation of the present public participation process in the Ministry of Forests. Guidelines for developing a "good decision making process" were presented and included elements that would produce effective public participation.

In general, the Commission concluded that provisions for ensuring public participation must be formally enshrined in legislation. If the process is to work effectively, the public must be convinced that more than lip service is being paid to the concept of public participation. As well, they must be able to see for themselves, through an open process, that their participation is having an impact. It must be emphasized that public participation should occur at the appropriate times in the planning and management process — early enough to have an impact on decision-making. It should not occur during the operational phase, when technical decisions are being made by professionals in the field.

Specific recommendations for public participation mechanisms — and the legislation required to implement them — are contained in the appropriate sections of this report. They are an intrinsic part of recommendations for the Land Use Plan, inventory development, the new Ministry of Renewable Natural Resources, tenure reorganization, and others. This chapter outlines public participation as it works now, and how it will work under the Forest Resources Commission's recommended new integrated resource management system.

The Forest Resources Commission recommends that:

108. all major areas where public participation is required in the planning and management of forest land based activities be enshrined in legislation.

2. Public Participation and the Ministry of Forest's Planning Process — Today's Policy

The Provincial Forests are divided into 6 Forest Regions and 43 Forest Districts. The Forest Districts correspond to many of the 35 Timber Supply Areas (TSAs). There are 32 Tree Farm Licences (TFLs.).

Five levels of planning include:

1) provincial level

2) regional level

3) TSA and TFL - resource management level

4) local resource use planning

5) operational planning

Provincial planning establishes policies, programs and procedures which are based upon government priorities, resource use opportunities and socio-economic considerations. At this level, legislation requires reports outlining a 5 Year Forest and

Range Program and a 10 Year Forest and Range Resource Analysis. These reports establish inventories, report on trends and provide goals and policies for managers.

The 5 Year Forest and Range Program establishes, through the Chief Forester, Allowable Annual Cuts for the TSAs and TFLs.

There is no formalized public involvement at this policy and planning level, although the Minister may develop special commissions and working groups to seek public opinion.

Regional level planning establishes a linkage between provincial goals and policies and industry and other ministries. There is no formal process for public involvement at this planning level.

The most comprehensive planning occurs at the resource management level (TFLs and TSAs) and it is here that the first formal provisions for public participation appear.

Planning steps for the development of a TSA Resource Management Plan or a TFL Management and Working Plan are fairly similar, although minor differences occur. The seven general planning steps identified in the Resource Planning Manual (1984) include:

1) Preliminary Organization - Includes identification of issues, objectives and options
2) Information Assembly
3) Development and Analysis of Options - Includes completion of Timber Supply Analysis, Recreation Analysis and Range Analysis
4) Evaluation of Options
5) Selection of Option
6) Implementation
7) Monitoring

Timber Supply Area Planning Process

TSA Resource Management plans cover a 20-year planning horizon, but are revised every 5 years. Timber supply forecasts under a variety of management scenarios are analyzed, along with other potential uses or values for the area.

Public input is required by policy to identify issues and management objectives, and the Ministry of Forests is required to notify the public of this opportunity. The public is also allowed to review the draft terms of reference. Public input is not required at any other stage of step 1, nor in step 2 (information assembly), or step 3 (analysis of options). Nevertheless, completed analysis reports are public documents and assistance in identifying issues is often solicited.

During the evaluation of options (step 4), the public is allowed to review the options report and the draft TSA Resource Management Plan. For the draft plan, the Ministry of Forests must notify the public and allow for written submissions. The Chief

Forester may approve a TSA Resource Management Plan based on the recommendation of the Integrated Resources Branch, the Region and the District. There is no requirement for public participation at this stage, although any public comments gathered informally are referred to the Chief Forester for consideration. Implementation of the TSA Resource Management Plan includes using the plan for management and in the development of sub-unit plans and development plans (see below), where the public may participate. The public does not traditionally participate in monitoring at the TSA planning level. Public participation is more frequent at the Local Resource Use Plan level where the goals and objectives of the plan are more quantifiable and measurable.

Tree Farm Licence Planning Process

The planning process for a TFL Management and Working Plan is completed by the licensee every five years, following guidel¹nes established by the Ministry of Forests based on Section 28 of the Forest Act (1979). No steering committee is required, and public participation opportunities are limited. Public participation is required at only two steps of the planning process, although increased public participation opportunities may occur at the discretion of the TFL planning staff.

At the beginning of the process (step 1), the licensee must advertise that the Management and Working Plan is being prepared and that the public may make submissions. The next opportunity for public participation occurs in step 4 of the planning process where the licensee must notify the public about an open house to view the draft Management and Working Plan. Like the TSA process, the TFL planning process allows 30 days for written submissions. Monitoring opportunities in TFL planning are now mandated by legislation, although not at the same level as in TSAs.

Local Resource Use Planning

Local resource use planning covers sections of TSAs where more intensive analysis and planning is required. Geographically, the planning unit usually involves a watershed, and planning is typically concerned with establishing more site specific management guidelines. Integrated management conflicts are often resolved at this level. In fact, the degree of potential conflict dictates how much planning and how much public participation are necessary.

The public participation process can range from nothing right up to a full-blown task force. The more complex the issue, the more comprehensive the planning process. Task forces involve the highest level of public participation, even though they remain only an advisory body. Participants of task forces include the government, industry, public interest groups, Native representatives and general citizens. Once a task force has completed its work, the next step is a joint planning team — with no provision for public participation.

Operational Level

The operational level covers the specifics of resource use. The last stage in the forest planning process looks at details of how and where timber harvesting will take place. There are two types of plans drafted here — Development Plans, which broadly outline proposed cut blocks; and Pre-harvest Silviculture Prescriptions and cutting plans, which outline specific cut-block boundaries and list conditions or harvest restrictions to protect non-timber resources.

After drafting a Management and Working Plan, the licensee is required to display the plan and receive comments from other government agencies and the public. Before approving the plan, the District Manager will consider the comments made by government agencies and the public.

While the specific cutting plans, drawn up by Ministry of Forests staff, must reflect consideration of those comments, they are not subject to public comment.

3. How the Process is Viewed by the Public and Industry

The Forest Resources Commission heard and read a wide range of concerns — from both the general public and industry — about the public participation process for forest management issues. Since public participation has been an ad hoc question of policy rather than a formal process guaranteed in legislation, that should come as no surprise.

Following is a representative listing of concerns raised by the public and industry. It was with these concerns in mind that the Commission set out to design a comprehensive public participation process and weave it through every aspect of the overall package of recommendations.

Public Concerns:

- there is no well defined public involvement process;
- decisions on resource management issues and objectives are made by the Ministry of Forests and industry representatives — no other interests are included;
- the TSA planning issues are already framed — complete with a built-in timber bias — when the public first gets to review them;
- there is no legislated process for public involvement, only policies;
- there is no formal appeal process on administrative decisions;
- public access to information and inventories is limited, precluding effective analysis;
- the TFL planning process has only limited public input opportunities;

- the costs to private individuals of constant consultation and reviews of plans are excessive;
- lobbying by special interest groups at the provincial planning level favours urban over rural interests;
- many special interest groups — unlike industry employees and their communities — suffer no economic or social consequences as a result of the planning decisions they are trying to influence;
- the harvesting agenda is always in the forefront of public involvement — the question is always how to harvest, not whether to harvest.

Industry Concerns:

- requirements for public involvement are costly and time consuming for companies, with little or no benefit at the end of the process;
- the general public has only a limited knowledge base on which to provide input;
- there is a good public involvement process already, but a public and political will to make decisions is lacking;
- existing efforts have met with a poor response;
- the number of splinter groups or stakeholders that must be satisfied is never-ending;
- there is no end to the process;
- constant changes to plans are costly.

While the Forest Resources Commission has recommended a major expansion of the public participation process to cover the entire scope of the recommendations in this report, it also has identified deficiencies in the current process as it relates to Timber Supply Areas and Tree Farm Licences where some urgent remedial action is required.

One of the basic concerns in forest planning lay in ensuring that all forest values were recognized when management decisions were made. In response to this issue, the Forest Resources Commission included a recommendation in its July 1990 Interim Report to Government that:

> **"The Ministry of Forests should re-examine the purpose, make-up and commitment to its Timber Supply Area Steering Committees with a view to making these more effective."**

In response, the government has reaffirmed its commitment to the TSA Steering Committees and has already begun to expand government ministry and private sector representation on them. A report to the Commission on this process is attached to this report in the Appendix.

4. Elements of an Effective Public Participation Process

Studies conducted for the Forest Resources Commission looked at practices in other jurisdictions and analyzed the existing process in the Ministry of Forests. From those studies, the Commission has outlined what it believes are the principal components of an effective public participation program:

a. It must have a legal mandate

b. The process must be easy to understand

c. Those involved must be accountable

d. Public access must occur at key levels of the process

e. Provision must be made to notify interested parties

f. People must have access to information

g. Participants must have adequate resources

h. Written reasons for decisions are essential

i. There must be a conflict resolution mechanism

j. There must be an appeal process

The proposals made by the Forest Resources Commission in this report will dramatically alter the current approaches to land use decision making. Among the components that will change are:

- The structure and approach of government to enhanced stewardship and developing management goals;
- The management of timber lands and the nature of rights and obligations accompanying their use and stewardship;
- The quality, availability and variety of resource inventories;
- The nature, quality and availability of educational support to the public in British Columbia.

Public involvement overlays all of these topics. Following is a brief description of the above components and references to their incorporation into the report of this Commission.

a. The Legal Mandate — Legislation:

Legislation guarantees that the public involvement process will be unequivocally applied in the resource management decision making process — because it is the law. It also provides a clear and consistent set of rules for managers to ensure that responsibilities have been complied with and performance is accountable. At present, public involvement is very much a policy decision.

The Forest Resources Commission has recommended that the public be involved at key levels of the Land Use Planning process. Legislation establishing the Land Use Com-

mission (documented in chapter 3 of this report) and its regional and local planning groups will ensure accountability for decision makers. The Regional Planning Groups, should they be established, will link at very high levels the processes of policy and goal setting with local land capability analysis and land designations. It was further recommended that the legislation of all ministries be reviewed to ensure that they support both comprehensive Land Use Planning, integrated resource management and enhanced stewardship. The development of a new Act to coordinate the management of the forests for all values by government will further ensure protection of the public interest.

b. Understandable Process

The public participation process and the planning and management functions it supports should be open and easy to understand. A single document that shows the public where and how it can get involved at key stages in the planning and management process is required. It should detail the nature of involvement that is proposed, the degree to which the involvement can be expected to influence decisions, the decision makers and decision points in the process, and the roles and responsibilities of all involved in the process. Responsibility for "triggering" public involvement should also be detailed.

A clearly-defined public involvement process will reduce administrative flexibility to some degree. However, accountability for decisions should be increased and the basis for conflicts over decisions should be reduced.

c. Accountability

An effective public involvement process will ensure that all values are considered in the planning and decision making process. Participants, and other interested parties, will expect that involvement will result in some influence on the decision making process as well as upon final decisions.

With decision making power comes responsibility. Neither the public nor resource managers want to see decisions made by those that will not be affected by or be held accountable for their decisions. Ultimately, politicians are held responsible to the public in elections. The decision makers and administrators in the Land Use Planning structure (chapter 3) proposed by the Forest Resources Commission will be appointed. Hence, accountability has been proposed via the legislation establishing the Land Use Commission.

The audit process established to monitor public and private tenure holders (tenure recommendations are explained in chapter 5) should also be considered part of the public participation process, since those audits will be made public. Accountability has been further strengthened by the Forest Resources Commission's recommendation that the Provincial Forester be required to report to the Legislature on the state of the forest (administrative recommendations are detailed in chapter 4.)

d. Public Access

It was recommended to the Commission that public participation should be comprehensive, occurring at key levels of the planning process from policy development to the monitoring of the implementation of plans.

The Forest Resources Commission agrees and has recommended the involvement of the public at all levels. The neutrality of the Land Use Commission and the reporting requirements of the Provincial Forester should dispel any lingering concerns that the process at the policy level is subject to undue political influence. This should spur a greatly renewed interest in public participation at the policy level. A primary source of public access to policy development will also continue through the permanent status of the Forest Resources Commission.

e. Notification of Interested Parties

At present, the public is notified when a forest planning process begins, and when there is an opportunity to review a draft TSA Resource Management Plan or TFL Management and Working Plan. The need to detail key 'entry points' for public involvement was discussed earlier, as was the desirability of placing the public involvement process into legislation.

However, the most effective means of ensuring that consultation and public participation takes place, and interested parties are notified of pending developments, will be the contractual arrangements between tenure holders (chapter 5) and the government. The remedies for failure to comply will also be contractual and will include the risk of losing the tenure entirely.

f. Access to Information

One of the primary shortcomings identified by the Forest Resources Commission in the present forest planning and management process lay in the quality of resource inventory information for all resource values. This is particularly true when data is required for specific planning areas. Different ministries have developed their inventory storage and retrieval systems in ways that make them completely incompatible with those of other ministries doing the same basic job. The quality of information also varies widely.

A lack of relevant information severely limits the effectiveness of all planning, including public participation. This concern led the Forest Resources Commission to recommend in its July 1990 Interim Report to government that:

> **The government immediately examine and implement ways by which the full range of forest related inventories can be made standard and able to be used on compatible systems while, at the same time, retaining the values for which they were originally intended.**

The Commission has further recommended in this report that the restructured Ministry of Crown Lands be made a 'focal point' for public access to resource information. This "value-neutral" Ministry should be made responsible for allocating funding to individual ministries for inventory development.

g. Adequate Resources

The Commission considered a proposal to assist, under narrowly-defined circumstances, those members of the general public or special interest groups who lack the resources to participate fully in the process.

The Forest Resources Commission has not made recommendations relative to this proposal, believing that it would be better addressed on an individual basis by such responsible bodies as the new Land Use Commission.

h. Written Responses

Section 2.16 of the Ministry of Forest's Resource Manual states: "All questions and recommendations from the public will be responded to. Reasons for non-acceptance of recommendations must be provided."

There is merit to this approach to justifying decisions, however it is limited to explaining the reasons why a particular course of action wasn't taken. It would be more useful to provide, in addition, written justification for actions taken, with a listing of the criteria upon which decisions were made. Over time, such a policy would provide a valuable source of information for all interested parties involved in resource issues, and might function much the same way court records do in the legal system, albeit in a less formal, non-binding manner. It also provides a backdrop from which to measure changes in management practices and changes in social values.

i. Conflict Resolution; Appeal Mechanism

The use of conflict resolution techniques has been proposed as an alternative to the present use of task forces or ministerial discretion. The cost of conflict over resources uses and their allocation between interest groups runs high.

Nearly everyone who addressed the Forest Resources Commission argued that a comprehensive Land Use Plan presented the best means by which conflicts over land use could be resolved. The Forest Resources Commission agreed, and has proposed a Land Use Plan that would relate land capabilities to provincial goals. This process will be an important step in confirming the sustainability of forest management practices and ensuring that stewardship reflects all values.

But an integral part of the Land Use Plan will be its ability to use mediation as a means of resolving conflict. The Forest Resources Commission has recommended that the Land Use Commission be empowered by legislation to make decisions upon land

use conflicts for all those disputes that fall within the provisions and goals of the Land Use Plan. The establishment of an independently-appointed three-member Appeal Board has been recommended to deal with appeals from those decisions. As an independent arbitrator accountable for its decisions, the Land Use Commission will reduce the present waste and exhaustion felt by all parties to the present Land Use Planning process.

At the forest land management level, dispute resolution will be much more defined under the Forest Resources Commission's proposals than it is at present. This will be due primarily to the establishment of rights and obligations within tenure documents. Performance requirements built into tenure contracts, and the penalties prescribed for non-performance will provide incentives to all interested parties to reach agreement and understanding on management planning and implementation.

The Forest Resources Commission is aware of the growing need to establish a core of trained mediators to facilitate conflict resolution. It has proposed that every effort be made to develop a trained group of mediators, and that this could be accomplished through the education system and the new Land Use Commission. (Recommendations for educational programs are contained in Chapter 9.)

5. Public Involvement in Planning and Management Under the Commission's Proposals:

Previous sections of this chapter outlined the general philosophy behind the Forest Resource Commission's recommendation to superimpose a public participation policy on Land Use Planning and integrated resource management.

This section explains how that philosophy is carried out in the various aspects of the new system. Public participation is essential at the planning and management levels — not at the technical, or operational level — and is concentrated around the Land Use Planning process, the integrated management planning process, and the follow-up audits conducted to monitor performance.

The framework for management planning is established in the development of the five-year Management and Working Plans. These are developed for both Tree Farm Licences and for Forest Licences. At this stage the goals and objectives are established for forest management. Public involvement will be established as a balance to the interests of the primary stakeholders in the plan, be they tenure holders for range or forests, or other licence holders. The equitable treatment of the public at this level of planning ensures that all values are recognized and accounted for with the initial establishment of management objectives.

The development plan is an annual update of the five year plan. It establishes a more concrete sequencing of harvesting and other management operations. Again, all tenure holders must be satisfied that their interests have been reflected in management planning. Public review of plans will ensure conformity with long-term goals and objectives for the area.

Application can then be made for approval of cutting permits, which involves timber cruising and block design. A Pre-harvest Silvicultural Prescription (PHSP) must be approved before a cutting permit is issued. This stage of the process ties operations back to the biogeoclimatic underpinnings of the Land Use Plan and the ecosystem requirements discussed in the timber harvesting sections in relation to the PHSPs. But preparing the Pre-harvest Silvicultural Prescription is a technical process done by professionals in light of planning decisions already made with ample public involvement. There is no need for further public involvement at this stage, as the follow-up audit process established to monitor performance is subject to public review.

The cutting permit application stage will be the point where planning disputes and conflicts between individual values must be resolved. The public will have a say through choices in the management options that are proposed. Conflicts between tenure holders for different values or uses can be negotiated, or resolved by the Forest Resources Corporation, which is ultimately responsible for ensuring good stewardship. The Land Use Appeal Board is available for those disputes that can't be resolved at the planning level.

Once cutting permits have been approved, the Resource Management Agreement holder (or the Forest Resources Corporation if it has the management responsibility) will be responsible for arranging an independent audit. The release of an independent audit will allow all interests, including the public, to ensure that management practices met the agreed goals and objectives as set out in the management plan as part of the Resource Management Agreement.

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Appendix 1

MANDATED TASKS

1. To provide the Minister of Forests and through him, the Government, with a comprehensive view of what the forests of British Columbia should represent. This view would take into account the full range of forest values, how the forest might be managed to protect and enhance those values and the total economic impact of the forests to the Province.

2. To advise the Minister of Forests and through him, the government, on the effectiveness of Tree Farm Licences as a form of tenure.

3. To recommend ways to improve public participation in forest planning and management.

4. To review and recommend ways of improving forest harvesting practices, focusing on clear-cutting and its associated forest practices and their impacts.

November 1989.

Appendix 2

TERMS OF REFERENCE

(June 29, 1989)

Revised March 7, 1990

1. The British Columbia Forest Resources Commission (the Commission) is established further to the Ministry of Forests Act. Section 2(3) (b) to:
   (a) advise the Minister of Forests on those matters related to his duties, powers and functions which he refers to the Commission.
   (b) undertake special studies and investigations on topics referred by the Minister for advice and recommendations.
   (c) undertake special studies and investigations on topics deemed to be important by the Commission, and make recommendations to the Minister on the findings.

2. The Commission shall report to the Minister of Forests.

3. The Commission shall establish its own procedures and make recommendations to the Minister of Forests with respect to its funding and operating requirements.

4. The Chairman shall be responsible for the supervision of Commission activities.

5. The Commission shall make recommendations on topics referred to it from time to time by the Minister.

6. The Commission or its members may be invested powers of inquiry under the Inquiry Act by the Lieutenant Governor in Council.

7. Membership on the Commission is to be broadly based and reflective of the various sectors with identifiable interests in the management and use of B.C.'s forest and range lands. The Minister of Forests is responsible for appointments, guided by the advice of Cabinet colleagues.

Appendix 3

HISTORICAL SKETCH

1. Introduction

By any standard, British Columbia is a spectacular landscape. From the rugged coastal rain forest to broad interior plateaus to the Rocky Mountain range — and all the lakes and rivers that occupy the valleys — it is the envy of Canada and indeed the world. The rainy coastline is fragmented and steep. Large areas of the northern interior are still de facto wilderness, affected more by nature than by man. First Nations peoples, who had occupied the land for centuries, watched European settlers pursue resource development and build roads, railroads and cities — concentrating their settlements in the mild coastal climate and the fertile north-south valleys of the south. Initially, few settlements occupied the northern half, a cold land of boreal forest, muskeg and alpine tundra.

Remarkable for its diversity, B.C. has four out of the five major types of world climate. There are 14 biogeoclimatic zones and the largest number of distinct ecosystems in Canada. The forest cover is extensive, varying with altitude and region. Hemlock, cedar, and Douglas fir dominate the coastal forests while lodgepole pine, spruce and balsam prevail in the interior. Vancouver Island boasts some of the finest conifer stands in the world, and the province as a whole has close to two dozen commercial species of trees.

Roughly 95 per cent of B.C.'s forest land is owned by the province. Another one per cent is federal land - National Parks and Indian reserves. Only 4 per cent is privately owned, although this includes some of the finest and most productive timber stands. Private ownership of forest land is much more significant in the United States and Scandinavia. In the U.S., 72 per cent of the commercial forests are owned privately, while in Sweden 50 per cent and in Finland 63 per cent are privately owned.

The Ministry of Forests is responsible for managing the provincial forests of British Columbia and administers them through the Forest Act, the Ministry of Forests Act, the Range Act and related regulations. The provincial forests cover 82 million hectares or 86 per cent of the land base of the province. Only 21.3 million hectares of this are classed by the Ministry as "presently productive, available and suitable" for timber production. The remaining forest land is not commercially productive at present for economic or environmental reasons, or because it was once logged or burned by wildfire but is not satisfactorily restocked (NSR) with commercially valuable trees. The present commercial forest constitutes less than 24 per cent of British Columbia's land area.

The forests are changed by their own natural cycles of growth and decay, as well as by timber harvesting, fire and disease. The forest land base is subject to change through reclassification for parks, dams, highways, utility lines and suburban development. At present 6 per cent of the province is officially protected as wilderness, park, etc.

British Columbia has 10 million hectares of usable rangeland, representing roughly 10 per cent of the total provincial land base. An estimated 8.9 million hectares is open and

forested Crown range or range land leased from the Crown. Most of the Crown ranges are found in the forests and higher alpine meadows, and they are used primarily for summer grazing. The privately held lands (roughly 1.1 million hectares) tend to be open range, often found in valley bottoms. These ranges are the most valuable spring and fall grazing lands.

Commercial timber production has provided a high standard of living for British Columbians since its start in the latter part of the last century. It has been a major factor in the spread of development away from the coastal communities and into the interior. While other industries — such as tourism and mining — have prospered in B.C., the forest industry is still the cornerstone of the provincial economy. Direct forest revenues to the Crown from stumpage, royalties, licence fees etc. in 1988/89 totalled $623.6 million. Three quarters of British Columbia's forest products are sold in world markets. The forest industry is export-driven, cyclical and highly concentrated, particularly at the manufacturing end.

The forests have many values other than timber. Forest watersheds supply drinking water for communities and they are the critical habitat and migration routes for sport and commercial fish species. The forests support livestock and wildlife. British Columbia is home to at least 280 species and subspecies of wildlife, 460 resident bird species (of which 285 breed here), 70 species of fish, 14 species of reptiles, 20 species of amphibians, and more than 3,000 species of plants. The forests also represent recreational opportunities as well as cultural and spiritual values.

2. History of Forest Management

Before 1910, timber harvesting in B.C. was unregulated. A tenure system was introduced in 1912 which, although modified several times, has shaped the use of the forests for timber production to the present time. After World War Two, timber harvesting in the interior grew substantially, and a centralized administration structure was introduced. For the first time, volume restrictions were introduced, and an attempt was made to calculate how much timber could be harvested on a sustained yield basis. The first reforestation programs were introduced, but not until the 1960s did those programs attain any significant scale.

When timber harvesting started in the 19th century, the government granted forest land for the building of railroads or sold it to firms and individuals. Trees were considered inexhaustible, and in fact the primary motivation for felling trees was to encourage settlement and farming. Through these Crown grants or alienations some of the best timberlands of Vancouver Island and the southern mainland passed into private hands. Up until 1907 another form of grant, known as "temporary tenures", allowed holders to rent land and cut mature timber only. A royalty or fee was paid on timber cut but there was no obligation to replant. Despite the land grants, the principle of public ownership of the forests goes back a long way in British Columbia. The Land Ordinance of 1865 stipulated that the government should retain ownership and control of unsold forest land, granting only the right to cut timber.

The population of British Columbia grew 700 per cent between 1871 and 1911 and demand for lumber triggered a scramble to obtain land grants and tenures. A fledgling industry took shape, primarily along the coast because water offered a cheap way of moving logs to mills and export markets. The Canadian Pacific Railroad, completed in the late 1880s, gave birth to several lumber-based communities all along the corridor. They sold their products to other growing communities back east through the prairies. Pulp and paper production came later, starting with a small Port Alberni mill that produced paper from rags in the 1890s. It gained momentum after 1910 when commercial production of pulp and paper began on the coast, utilizing comparatively new mechanical and chemical technologies. By 1923 the province had seven pulp mills and one newsprint mill, although by 1926 two of these had closed.

By 1911 there were 224 sawmills in the province. Some of the sawmills were connected to small communities and local men often combined logging with farming and fishing. But there were also dozens of entrepreneurs from other parts of Canada and the United States who saw an opportunity to get rich logging the timber valleys of British Columbia.

Speculative lumber staking at the turn of the century convinced the government it needed some rules and regulations. F.J. Fulton was appointed to head a three-man Royal Commission of Inquiry on Timber and Forestry. In his 1910 final report, Fulton noted that lack of a reliable forest inventory made it difficult for the government to formulate sound forest policies. But, working with available statistics, he concluded that two-thirds of the merchantable timber land had already been alienated and that this shquld satisfy the needs of the forest industry for several decades. He advocated retaining the rest of the forest land intact as a reserve for the future. Special needs could be answered through competitive timber sales. As a result, timber sales became important because until 1948 (when Tree Farm Licences were introduced) they were the only significant means by which new entrepreneurs could gain access to Crown timber.

As a result of Fulton's inquiry, the province's first Forest Act (1912) was passed, and a Forest Branch of the government was established. The Forest Branch later became the Ministry of Forests. Perhaps equally significant, however, was a recommendation that was not adopted. Fulton advised the province to put the royalties it collected from timber harvesting into a "sinking fund." This money was to be set aside and used for the protection and restoration of the forest. It was the first formal recommendation to government that it provide for the future health of the forests.

By the early 1940s, a burgeoning forest industry was pushing up against the supply limits of the committed forest lands, and short-term timber sales couldn't make up the difference. Larger mills were being built and they needed a secure supply of wood fibre. Ironically, while huge stands of untouched timber grew in the interior, some of the coastal areas had in fact been overcut. It was becoming clear that the province needed a system of tenures that would allow mills long term access to timber on public lands, and that the future yield of those lands needed to be considered.

Once again, the provincial government looked to a Royal Commission for help in designing appropriate policies for timber harvesting. In 1945, the Hon. (later Chief Justice)

Gordon Sloan was asked to look at the concept of managing the forests for perpetual or sustained yield — that is harvesting in each year only that volume of timber that the forest can regrow. Europeans had been managing their forests for 350 years, and many in British Columbia felt the time had come for B.C. to adopt similar policies.

Sloan recommended the division of the Crown forests into private and public management units, to be managed for sustained yield. Incorporated into legislation in 1948, his tenure recommendations had far-reaching effects on the forest industry. Tenure reform appeared to accomplish several government objectives. The public continued to own the land but the private sector got the right to use it. The government believed it was giving industry both the access to timber and the security of tenure it wanted, while, if successful, sustained yield management would ensure that the province never ran out of trees.

Two types of tenure were introduced. The forest management licence (renamed a Tree Farm Licence in 1958) was designed to enable owners of Crown-granted land and old temporary tenures to combine these with enough Crown forest to form a self-contained management unit. The holder secured exclusive cutting rights in this licence area for a renewable 25-year term in return for a commitment to conduct sustained yield management under Forest Service supervision. As a form of tenure, it was popular with the industry. In Public Working Circles (renamed Public Sustained Yield Units —PSYUs,) smaller enterprises that could not afford or did not wish to take on the responsibility for managing the forest had access to the regulated harvest through competitive Timber Sales, while the unit was managed by the Forest Service.

Under the new sustained yield policy, an Allowable Annual Cut (AAC) was determined for each PSYU based on its timber inventory and productive capacity. In some areas, the new harvest level was below the cut established operators had been accustomed to under the competitive bidding process. To reconcile this difference, the Forest Service introduced a sharing or "quota" system proportionate to the licensee's former cut. The quota system became entrenched in the tenure structure. The ongoing annual volumes of timber that holders were authorized to harvest became known as their "quota" position in a PSYU.

Commissioner Sloan conducted a second review of the forests in 1956, and essentially endorsed the existing policy. But he warned that both the private sector and the Forest Service needed to greatly increase their rate of tree planting if productive forest land was to be maintained and not satisfactorily restocked (NSR) land reclaimed. Sloan also pointed out the benefits of maintaining forest cover for such important non-timber values as watershed protection, game sanctuaries, and aesthetic values. He commented: "... if the government continues to be influenced unduly by the profit motive, it is inevitable we will pass on to future generations an impaired and diminished forest resource."

After Sloan's first report in 1946, a Silviculture Fund was established. It was applicable only east of the Cascades and financed from the royalties or stumpage collected from timber harvesting. The fund lasted only ten years, and in 1956 was replaced by an annual statutory appropriation from the province's general revenues. It, too, was derived from a levy on stumpage, but was subject to the vote of legislature. Four other government

attempts were made before 1978 to support reforestation with committed funds, but funds were appropriated only when the economy was strong. Between 1948 and 1987/88 the costs of reforestation of Crown land was primarily borne by the government, either through direct funding or through deductions made to stumpage paid by industry.

The quality of forest management became a public concern after the Second World War. The Forest Act was amended in 1950 so that tree seedlings could be supplied at no cost to private forest owners for the replanting of denuded Coastal sites. Three years later the Forest Service was authorized to examine denuded private forest land and enforce replanting on not satisfactorily restocked (NSR) land.

While coastal forestry got a lot of attention in the first half of the century, interior forests were all but ignored. By the end of the 1950s, an influx of new residents and demand for forest products gave rise first to a modest industry of bush mills and, ultimately, sawmills and plywood plants at railhead. Utilization standards (regulations governing how much of the wood, in the form of branches, stumps, etc. can be left on the ground) in both the woods and mills were rough or, at best, intermediate. Reforestation was entirely left to nature.

In the 1960s, government policies and the proximity of good railroads spurred the rise of a vigorous pulp industry in the central interior. The CPR line linked the coast and Eastern Canada while the Pacific Great Eastern line had been extended in the 1950s from Vancouver through Prince George to the Peace River area. Prince George and many other interior towns became planing mill centres, processing the rough lumber originating from the hundreds of local bush mills. The era of the bush mills ended and sawmills moved into centres like Prince George, Quesnel and Williams Lake.

The interior's first integrated lumber and pulp mill was built at Castlegar on the Columbia River in 1961. Its raw material was partly chips from its own sawmill and partly pulp logs supplied from local mills. Other pulp mills followed and soon the demand for fibre for pulp and paper operations grew to a significant volume. To protect this new sector of the forest industry from any possible shortfall in chips, and to give it some clout in the acquisition of fibre supply, the Forest Act was amended in 1961 to authorize the Minister of Forests to designate any PSYU in the interior as a Pulpwood Harvesting Area. If the sawmills of the area could not provide enough chips the Pulpwood Harvesting Area Agreement allowed the licence holder to cut timber unsuitable for lumber. In return, the licence holder agreed to build and operate a pulp mill of a prescribed capacity and to purchase chips locally if they were available. These Agreements were intended to provide for a start-up or emergency source of chips and, in practice, the pulp companies rarely needed to exercise their option to cut timber.

The introduction of "close utilization" in 1966 was a milestone in British Columbia forest history, and went hand-in-hand with the development of the pulp and paper industry. Prior to the introduction of this new standard, small or defective timber was either left standing, or if cut down, left to rot on the ground. The industry operated on an "intermediate utilization" standard, which was based on removing only the wood that could be processed into lumber products. Pulp and paper operations, however, could use

this "defective" lumber to make chips for the pulping process. This new close utilization standard also opened up logging in lodgepole pine stands, which had not previously been used.

By 1974 there were 11 pulp mills in the interior, adding to the existing 14 Coastal mills. The new mills were highly automated and served markets in the United States, Europe and Japan. Most were integrated lumber and pulp operations and required a considerable capital investment. Over time, small operators found they couldn't compete and they ultimately sold out to their larger competitors. This eventually produced a handful of extremely large companies, many of which were held by out-of-province shareholders, either fully or in large part. For the government of the time the benefits were the opening up of the central and northern interior through private sector resource development, the revenues generated, and the community stability fostered by large and well-financed corporations tied to a local resource.

More stringent utilization standards in the woods meant that the actual volume of wood extracted from a given unit of land went up. But the old AAC "quota positions" were based on the intermediate utilization standard. This additional volume, or cut, was termed "third band" volume and in parts of the interior which had large stands of small or over-mature timber it was significant. The Forest Service allocated the third band timber through Timber Sale Licences, with eligibility requirements that favoured the established licensees.

By 1975 the provincial timber harvest from Crown lands had reached 50 million cubic metres (compared with only 20 million cubic metres in 1945 and 75.6 million in 1988/89.) The industry was strong and growing, but there was evidence of discontent within the province. Many believed that the tenure system favoured large, integrated licensees, who were frequently multinationals. Only minimal silviculture was undertaken by licensees, particularly on Crown land. Royalties and stumpage were thought to be generating less for the provincial purse than they might.

Once again, the government went to a Royal Commission. UBC economics and forestry Professor Peter Pearse was appointed in 1975 to review the current state of timber allocation and formulate policy recommendations to ensure that the forests made a full contribution to the economic and social welfare of British Columbians, that the Crown received full value from the timber harvest, the industry remained efficient and vigorous and that domestic participation in its ownership and control was adequate.

Pearse's 1976 report, Timber Rights and Forest Policy in British Columbia, recommended simplification of the very complex tenure system, a shift of responsibility from the Crown to industry for reforestation and silviculture, and greater opportunities for the small operator. The report also recognized non-timber values in the forests such as wildlife, water and fisheries. And Pearse suggested involving public agencies besides the Forest Service in regional planning to resolve potential conflicts before logging began.

Many of Pearse's recommendations were accepted. A new Forest Act was introduced in 1978, together with a Range Act and a Ministry of Forests Act. The latter established and

defined the functions of a new, separate Ministry of Forests, provided for some reorganization of the Forest Service and required regular reporting on the status of forest resources.

The tenure system was reformed and simplified. The perpetual rights of 16 area-based Tree Farm Licences were replaced by "evergreen" terms of 25 years. Forest Licences replaced the old Timber Sale Harvesting Licences and the PSYUs were converted into a third as many Timber Supply Areas (TSAs). A further measure replaced Pulpwood Harvesting Area Agreements with Pulpwood Agreements. Woodlot Licences replaced the Farm Woodlot Licences to open the program to a wider range of participants. The volume of timber available for competition was doubled to give small business operators more opportunities.

Since the 1950s, forest licence holders had been paying for basic forest renewal on their tenures and deducting the costs from the stumpage they paid the government. But in 1988, the Forest Act was changed so that companies still had the responsibility to renew the forests, but could no longer deduct the costs from their stumpage. All licensees were required to submit a Pre-Harvest Silviculture Prescription (PHSP) for every cutting permit, prepared by a professional forester. The PHSP legally obligates the licensee to ensure that a free-growing crop of trees is established after logging. Reforestation in the unlicensed portions of TSAs remained the responsibility of the Forest Service under the new Forest Act and is mainly done by contract.

At the same time, an expanded self-financing Small Business Forest Enterprise Program was introduced. The program goals were to allow small operators to enter the forest products industry through timber sales, encourage diversification and regional employment through the development of specialty wood products, and ensure that the most efficient firms are awarded timber sales.

About 15 per cent of the provincial timber harvest from Crown land is now administered under the Small Business program. The timber comes, at least in part, from a 5 per cent reduction in the Allowable Annual Cut of the major licensees. The Forest Service is responsible for reforestation, main road construction and planning, drawing the needed funds from timber sold.

While commercial timber production remains the dominant use of the Crown forests, society now demands equitable consideration for a range of other values, such as recreation and aesthetics. Despite the fact that many provincial ministries have legislation and regulations that may impact forest use, the Forest Service has primary responsibility for the non-timber values of the forest resource. This is a heavy burden for an agency that has been seriously understaffed, particularly at field level, since the reorganization and "down sizing" of 1981/83. Even in the mid-1970s, as a submission to the Pearse Commission noted, the staffing levels of the British Columbia Forest Service were approximately one-tenth of the United States Forest Service, based on comparable forest areas, annual timber harvests and generally comparable responsibilities.

3. Ranching and Range Lands

The raising of livestock — cattle, sheep, horses, etc. — goes back to gold rush days in B.C. The husbandry of cattle for beef production is the prime activity on the range lands of the province. Sheep and horses are the only other significant domestic livestock. The new industry was encouraged by the government's generous land lease policy and the markets opened up by the new railroad. By the turn of the century all the southern interior's open range land had been claimed. In the first two decades of this century ranching expanded into the forests of the southern interior. Ranching developed in the Kootenays in the 1930s and 1940s as transportation improved and became important in the northern and central interior in the 1960s, mostly through the expansion of cleared pasture. Big ranching companies dominated the industry, largely due to the heavy capital investment required for start up.

The Ministry of Forests, under its variant titles, has been responsible for range lands since 1917, the date of the first Grazing Act. Research and education programs for ranchers are offered by the Ministry of Agriculture through a protocol agreement. In 1978 the old Grazing Act was replaced by the Range Act, which provided for longer-term leases and placed a new emphasis on the coordination and integration of forest and range use.

The Act authorizes the granting of grazing and hay cutting licences and permits. The Grazing Licence, the most significant of these contracts, requires the rancher to provide an acceptable grazing management plan. It is a 10-year contract that gives access to the forage on a specified area of Crown range for a specified number and kind of livestock during the summer months.

About 90 per cent of the usable Crown range lands are found in the southern interior in four agricultural reporting regions. The Cariboo is the largest (2.6 million hectares) and most productive, followed in order by Thompson, Okanagan and Kootenay. The rest of the usable range land is in the three regions of the northern and central interior - the Peace River, Omineca and Skeena. Sheep farming is essentially confined to the Thompson-Nicola and Okanagan valleys and the Gulf Islands.

The livestock industry is of major economic significance to commercial centres in the interior of British Columbia. Cities and towns like Kamloops, Williams Lake, Lillooet, Merritt, Lac La Hache, Cottonwood, Nazko, Clinton and district, Chilcotin, Tatla, Anahim and Kettle River depend on ranching as a stabilizing factor when the more cyclical forest industry of the region takes a downturn.

Ninety per cent of the range land under permit or licence is also managed for timber production and for wildlife feed and habitat. Logging tends to increase the supply of usable forage and provide access to new grazing lands, although the supply of forage can also be reduced by forest regeneration and fire protection. British Columbia has the greatest diversity of wildlife species in Canada and the forest and range lands are the prime habitat and feed source of elk, moose, bighorn sheep and deer. The challenge is to manage for timber as well as the varying forage/browse needs of cattle and wildlife on the same land base. Water production from forest land watersheds is also of immense importance to the agricultural industry.

In 1881 the province's cattle numbered 70,000, but by the end of World War I the herd size was 190,000. By 1976 the summer beef herd size was some 350,000 head, and in the summer of 1990 cattle and calves together numbered 740,000, of which 266,000 were raised mainly for beef purposes. Direct revenues to the Crown from grazing permits and fees amounted to $1.6 million dollars in 1988/89 and the value of cattle and calf production was estimated at $183 million, almost 16 per cent of total provincial agricultural production.

4. Tourism and Recreation

Tourism emerged in the postwar period as one of the province's leading economic sectors, helped by rising income levels, improved transportation, and growing awareness of the province's spectacular scenery and opportunities for outdoor pursuits. The opening of the Trans-Canada Highway in 1962, and the improvement of the provincial highway network brought many more tourists to the province and stimulated the establishment of fishing camps, hunting lodges, ski resorts, motels and restaurants as well as hospitality, outfitting and guiding and many other commercial services. Expo 86 attracted over 22 million visits and resulted in international exposure for the province.

A significant supplier of jobs, the tourism industry is complex and the economic benefits are widely distributed. More than seven million people visited British Columbia in 1989 — half of them from other countries — and they generated revenues of nearly $4 billion.

While 75 per cent of the tourist dollars were spent in southwestern British Columbia and Vancouver Island in 1989, the Okanagan-Shuswap area and many communities of the southern and northern interior also benefitted. Outdoor adventure tourism is growing at 20 per cent a year and currently generates approximately $150 million a year. In ranching towns like Williams Lake, Anahim Lake and Kamloops, the annual stampedes continue to attract spectators for cowboy sports.

While the province's network of parks is the most popular outdoor attraction, many tourists find lots to do in Crown forest land outside the provincial parks. Numerous camping sites, fishing lakes and remote hiking trails have been made accessible through logging roads, while trails and picnic sites are frequently maintained by the Forest Service and forest companies.

5. Parks

The park system has developed over 75 years. There are today some 384 parks and they cover 5.4 million hectares. Another 200,000 hectares are in recreation areas, wilderness conservancies, ecological reserves, forest wilderness and wilderness reserves. The mandate of the Ministry of Parks is to protect the natural environment and provide recreation opportunities. In 1911 Strathcona became the first of the provincial parks, followed in later

years by Mount Robson, Garibaldi and others. In the 1950s and 1960s, as auto-touring and boating became popular, new parks were selected for recreation potential. The Park Act passed in 1965 added conservation to the park mandate.

There is public pressure to add more land to the parks system. The Ministry of Parks has a major initiative underway to complete a provincial parks system plan. Recognizing the limitations of a finite land base that must be shared with other values, selection of parks in recent years has focussed on areas that represent the best features and diversity of the province.

6. Ecological Reserves

British Columbia was the first province in Canada to formalize and give permanent status to ecological reserves as part of a world-wide endeavour to conserve selected terrestrial and aquatic ecosystems. The Ecological Reserves Act was passed by the British Columbia Legislature in 1971 and today there are 123 ecological reserves comprising 157,119 hectares, including marine waters. Most were established on Crown land and they include areas which are representative of natural ecosystems and areas that contain unique and rare examples of botanical, zoological or geological phenomena.

Appendix 4

AN INTERIM REPORT

OF THE BRITISH COLUMBIA FOREST RESOURCES COMMISSION

July, 1990

INTRODUCTION

Arising from the more than 1700 submissions the Commission received and reinforced by the round of public meetings the Commission engaged in this past spring, four issues emerged that, in the view of the Commission, can and should be addressed now and not have to wait until the major recommendations are submitted early next year. These issues have to do with the availability and compatibility of inventory information relating to all forest values; the need for the formal education systems of this Province to address better the importance of natural resources; the adequacy of public input into forest resource planning and management, particularly as they relate to T.S.A. Committees; and the serious uncertainty affecting forest land use decisions resulting from the land claim issue.

The Commission recognizes that by commenting on these issues in advance of its major recommendations to government, it may be seen by some as taking certain issues out of context. The Commission believes, however, that a variety of factors provide strong reasons for putting certain specific recommendations or comments forward at this time. In doing so, the Commission believes that the government can reasonably take some specific action now and that these actions, albeit small, should provide at least a start to improving forest resource management in British Columbia.

INVENTORIES OF FOREST VALUES

The Commission found, through written submissions, public meetings and detailed interviews with provincial government ministries, that good inventory information pertaining to the full range of forest values and to the capacity of the forest land base to support those values is seriously inadequate. The Commission also found that where inventory information does exist in one ministry, it is often not compatible with inventories developed in other ministries for other purposes. The result is that decision makers and the public have a very inadequate and imperfect information base on which to base decisions or debate.

The result of not knowing, in an adequate way, what values are inherent on specific areas of our forest lands, is predictable. Long-term decisions are often made in the absence of good knowledge of all the forest values being impacted on or with little regard for values

other than the specific one being managed for. Further, the public is often confused and subject to being given conflicting and sometimes false statements as to what values may or may not be on any given land base or what the impact on those values may be by any given management practice.

The Commission believes that significantly greater effort will have to be spent to address inadequacies in the inventory information base in a number of areas. Given that the exact nature and extent of inventory information will depend, in large measure, the forest management processes proposed and adopted, the Commission will address this issue in greater depth as part of its major recommendations.

Of immediate concern, however, is the lack of standardized inventory information and, therefore, a lack of compatibility of the inventory information presently collected and processed by provincial government ministries. The Commission has identified at least ten ministries that currently hold inventory information relating to specific forest values or to the forest land base.

These are:

1. Agriculture and Fisheries
2. Crown Lands
3. Energy, Mines and Petroleum Resources
4. Environment
5. Forests
6. Municipal Affairs. Recreation and Culture
7. Native Affairs
8. Parks
9. Tourism
10. Transportation and Highways

These inventories have generally been developed to meet some historical, ministry-specific need and, in many cases, have been developed without regard for their compatibility or relationship to inventories of other forest values. The Commission believes that better and more compatible information about all forest values must be made available if more informed and reasoned debate is to occur. This is particularly important in areas where more than one forest value is to be part of a forest land base decision. Accordingly, the Commission recommends that:

The government immediately examine and implement ways by which the full range of forest related inventories can be made standard and able to be used on compatible systems while, at the same time, retaining the values for which they were originally intended.

EDUCATION

Throughout all of its investigations to date, the Commission has become increasingly aware and concerned at the woeful lack of understanding of the importance of the resource industries to British Columbia, and of the practices that are carried out in managing those resources. This is particularly true of our forests and of forestry practices. Time after time, the Commission has found that public perceptions are significantly at odds with the actual facts of a given situation. The Commission is also aware that in many a debate and often in decision making, perception is reality and the current gap between the two is, the Commission believes, creating a serious, if not dangerous, situation in British Columbia.

Again, the Commission will have more to say on the subject of education when it submits main recommendations. However, the Commission did note that the public school system is currently undergoing major reform in the Province and as part of that reform, the curriculum is undergoing significant revision. Since the purpose of the British Columbia school system, as stated in the School Act, is:

"To enable learners to develop their individual potential and acquire the knowledge, skills and attitudes needed to contribute to a healthy society and prosperous and sustainable economy,"

the Commission believes that greater emphasis is needed in the curriculum throughout the primary, intermediate and graduation years on the overall importance of the resource industries, particularly the forest, to the social structure and to the economy of the Province. The Commission believes that the educated public of this province should understand the importance of our forest industries in shaping the Province, in maintaining certain communities, in providing for services such as health and education, and generally in helping to maintain a lifestyle unequalled in most areas of the world. The public should also have a better understanding of forest practices, why they are used and what their effects are. Accordingly, the Commission recommends that:

The Ministry of Education be directed to include significant information about the importance of the resource industries to the Province of British Columbia, particularly the forest resource, and also to include accurate, balanced material about forest management practices at all levels of the curriculum.

TIMBER SUPPLY AREA STEERING COMMITTEES

During the conduct of its business, the Commission heard repeatedly that Timber Supply Area Steering Committees (T.S.A. Committees) were generally not working well. In submissions and public testimony, the public cited lack of management commitment and lack of adequate balance from interest groups, other than the Ministries of Forests and Environment and the licensees, as being at the heart of the problem. While being openly critical of the current structure and public access to T.S.A. Committees, the public generally felt that the concept was a reasonable one and could be improved upon with relative ease. This was particularly true where T.S.A. and Forest District boundaries were the same.

While the Commission intends to address the whole area of public participation in the planning and management of B.C.'s forest lands in its full report, it believes that the Ministry of Forests can and should take immediate action to improve the workings of the existing T.S.A. Committee structure. Accordingly, the Commission recommends that:

The Ministry of Forest should re-examine the purpose, and makeup of and commitment to its Timber Supply Area Steering Committees with a view to making these more effective.

LAND CLAIMS

In every region of the Province and from individuals and groups across the whole spectrum of society, the Commission heard concern over the land claims issue and the strong desire that it be resolved. In commenting on this matter, the Commission is fully aware that the issue of land claims is not part of its mandate. However, because the concern is so widespread, the Commission believes it has responsibility to pass the concerns it heard through to the government.

First and foremost, the Commission found that the land claims issue is creating a high degree of uncertainty over the Crown lands of the Province. As most of these are provincial forest, the outstanding land claims issue is affecting forest practices. Forest companies, for example, are thinking twice about investments that have long pay-back periods. This is particularly true of investments in silviculture. Communities are concerned that their stability may be threatened and workers are concerned that their jobs and economic well-being may be threatened.

While expressing almost unanimous concern, groups and individuals across the Province do not appear to be comfortable with using the courts as a means of settling the issue. The overwhelming view of British Columbians, from whom the Commission heard, is that they want the land claims issue settled as soon as possible and they want it accomplisned by negotiation among the parties directly involved: namely, the aboriginal people and the federal and provincial governments.

Appendix 5

Ministry of Forests Response to Interim Report

Province of British Columbia
OFFICE OF THE DEPUTY MINISTER

Ministry of Forests

Parliament Buildings
Victoria
British Columbia
V8W 3E7

RECEIVED
MAR 25 1991
BRITISH COLUMBIA
FOREST RESOURCES COMMISSION

March 22, 1991

Mr. A. L. (Sandy) Peel
Chairman
British Columbia Forest Resources Commission
7th Floor - 747 Fort Street
Victoria, British Columbia
V8V 1X4

Dear Sandy:

Thank you for the opportunity to summarize the response of this Ministry to the recommendations contained in the Interim Report (July 1990) of the Forest Resources Commission.

Two recommendations are of particular significance to this Ministry, namely:

- that the government immediately examine and implement ways to standardize forest-related inventories used by different ministries; and,

- that the Ministry of Forests re-examine the purpose, the membership of, and its commitment to, timber supply area steering committees, with a view to making these more effective.

We have taken these recommendations seriously as important foundations for making long term improvements to the resource planning and management system and I would like to summarize some highlights.

Inventory Coordination

The Commission's recommendation is supportive of our long term direction which features:

- Inter-agency coordination on mapping specification and standards which are essential to the systematic and efficient collection, storage and retrieval of corporate land based

..../2

data. The Ministry of Forests is actively working with other ministries on this essential task, especially the Ministry of Crown Lands who map topographic, planimetric and cadastre, while we are responsible for mapping forest tenure and "multi-layered" forest inventory data.

- Interministry coordination through a "Land Information Steering Committee" (LISC) which was established by and reports to the Deputy Ministers' Committee on Sustainable Development. It is responsible for directing the development of a corporate (across government) land information system. The Ministry of Forests is an active participant on LISC and its various working sub-committees. This Ministry will be contributing forest tenure and forest inventory components to this corporate data base.

- Active interministry cooperation to develop integrated geographic information systems (GIS) across government. A "Corporate Land Information Strategic Plan" (CLISP) has been developed as a blueprint for integrating multi-agency geographic information, under the Chairmanship of the Ministry of Crown Lands. The Ministry of Forests is an active participant in this initiative.

- Proposing and leading a GIS based mapping and inventory pilot project on the Queen Charlotte Islands which successfully integrated resource data from a variety of sources, using pre-defined specifications and standards. It was used as the basis for an operational trial, conducted by an interministry team, with the active cooperation of vendors of "off-the-shelf" software. It was used to demonstrate the capacity of various software for assembling and using GIS data for resource planning.

..../3

While a fully developed GIS system capable of integrating resource databases is in the future, this project has been a fundamental building block and has reinforced our corporate commitment to integrate and maximize the use of spatial data in a corporate environment. Already we have some operational capacity to use GIS as a working tool with forest inventory data in our forest regions.

- Our Inventory Branch convened LISC representatives involved with forest resources to develop a work plan which includes:

  - summarizing current types of inventories and their standards;
  - developing a view on new information requirements and the standards and procedures to collect them; and,
  - producing common standards, procedures and defined data collection responsibilities, including those of the private sector.

Steering Committees

The Ministry of Forests is currently implementing the recommendations of the Commission with respect to the composition of and commitment to Timber Supply Area (TSA) Steering Committees.

This initiative has been combined with the development of new planning policy and procedures for forest management planning at the Forest District (TSA) level. These new policies will ensure that the planning process gives balanced consideration to all of the resource values on provincial forest lands.

Within this revised process, an Inter-agency Planning Team will be established to assume the planning coordination role currently undertaken by TSA Steering Committees. This inter-agency team will provide technical support to the process, ensure that all resources are considered, and access all feasible resource management options. This team will be

..../4

Ministry of Forests Response to Interim Report, continued

responsible for public and user involvement as part of the resource planning process to ensure that all resource interests are represented in a balanced and equitable way.

This new planning team structure and its associated process and procedures, will be implemented in 1991, applying to all new comprehensive planning projects undertaken at the Forest District (TSA) level.

Thank you for this opportunity to bring you up to date regarding actions taken by the Ministry of Forests in respect of the July 1990 interim recommendations of the Commission.

Yours truly,

Philip G. Halkett
Deputy Minister

Appendix 6

Ministry of Education Response to Interim Report

Province of
British Columbia

OFFICE OF THE
DEPUTY MINISTER

Ministry of
Education

Parliament Buildings
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Telephone: (604) 387-4611
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December 21, 1990

RECEIVED

JAN - 2 1991

BRITISH COLUMBIA
FOREST RESOURCES COMMISSION

Mr. A. L. (Sandy) Peel
Chairman
British Columbia Forest Resources Commission
700 - 747 Fort Street
Victoria, British Columbia
V8V 1X4

Dear Mr. Peel:

I am writing in response to your letter of November 6, 1990 in which you urged that the Ministry of Education implement the interim recommendation of the Forest Resources Commission calling for the inclusion of balanced information about the forest industry at all levels of the curriculum.

In previous correspondence I have attempted to outline a number of actions that this Ministry is taking to address the recommendation. Of necessity, these actions have attempted to focus on the Ministry's efforts to implement the recommendations of the Sullivan Royal Commission and at the same time acknowledge the need to present resource and environmental issues in a fair and balanced manner.

Given the importance of the forest resource to the British Columbia economy and in light of the Forest Resource Commission recommendation, I recognize the need for the Ministry of Education to become more proactive in its efforts to include resource and environmental issues within all levels of the curriculum. To this end, Ministry branches will be undertaking several projects to ensure that appropriate attention is given to these issues.

As a part of the on-going curriculum review and revision process, special attention will be paid to resource and environmental issues. In particular, the Sciences curriculum will be reviewed at the Intermediate level in 1991 in an attempt to ensure that these issues are addressed. A similar review will take place for the Intermediate Humanities (Social Studies) curriculum in 1991-92. Graduation Program curricula will be reviewed beginning in 1992 except in the area of General Studies where some work has already begun. Current proposals indicate that this curriculum will be issues-based. Efforts will be made to ensure that forest management and environmental issues are included as an important part of this curriculum.

.../2

Ministry of Education Response to Interim Report, continued

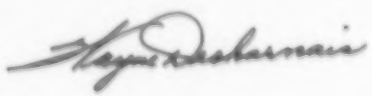
The Primary Program curriculum is currently in its optional year and will be reviewed after feedback has been received from initial implementation efforts.

To assist in all of this work, the Ministry is currently considering the establishment of a number of advisory committees which would include representation from business, industry, and education. It is anticipated that these committees will be established early in the next fiscal year. These groups should provide a mechanism for the inclusion of important resource and environmental issues in the curriculum and provide assistance in identifying ways that students can gain access to first-hand information about British Columbia's resource industries through expanded technology education, career preparation, cooperative education, and work experience programs.

As a result of this increased focus on resources and the environment, it will be necessary to identify a wide-range of learning materials for use by students and teachers. In the future, the Ministry will specifically request that publishers and agencies submit materials related to forest management, resource management, and environmental issues for review. By selecting an array of materials on these topics it should be possible to achieve the balanced view that is desired.

It is my belief that the above actions provide a strong focus for our efforts to encourage a greater understanding of resource and environmental issues on the part of all of the students of our Province.

Sincerely,



W. Desharnais
Deputy Minister

cc. Jack Fleming, Assistant Deputy Minister, Educational Programs
Barry Carbol, Executive Director, Program Development Division
Robin Syme, Director, Curriculum Development Branch
Rick Connolly, Director, Learning Resources Branch

Appendix 7

RESOURCE MANAGEMENT AGREEMENTS

Explanatory Notes

The Chapter on Renewable Natural Resources proposes the establishment of a Crown Corporation, the Forest Resources Corporation, to provide a management and financial mechanism for managing those lands designated under the Land Use Plan as being Integrated Use Management Area that include timber harvesting and range potential.

The Chapter on Tenure proposes contractual arrangements between the Forest Resources Corporation and individual resources users called Resource Management Agreements.

The following section provides samples of the documents that would establish the right of the Forest Resources Corporation to manage these lands (Head Lease) and the terms and conditions under which it, and resource users would be delegated management authority (Resource Management Agreements).

The Act establishing the Forest Resources Corporation is called, for illustrative purposes in the attached sample documents, the Integrated Resource Management and Tenure Administration Act.

This Act will establish the Forest Resources Corporation, provide it with goals and purposes, establish management authority, establish accountability and introduce restrictions on the conduct of the Corporation and those it contracts with.

The enabling legislation will establish a reporting relationship to government through the Minister of the proposed Ministry of Renewable Natural Resources. All shares of the Corporation will be vested in that Ministry.

Statutory requirements such as managing according to the proposed Land Use Plan, using practices defined under the proposed Forest Practices Act, and verifying the results via the proposed independent audits will be established in this Act. Remedies for non-compliance will also be defined in this Act. However, a dispute settlement mechanism for conflicts within the Land Use Plan between resource managers should be independent, and is proposed for establishment via the Act establishing the Land Use Commission.

Sample Document, for illustrative purposes only

A. HEAD LEASE

BETWEEN:

HER MAJESTY THE QUEEN IN RIGHT OF
THE PROVINCE OF BRITISH COLUMBIA AS REPRESENTED
BY THE MINISTER OF_____

and

THE FOREST RESOURCES CORPORATION

AUTHORITY: The Head Lease and subsequent Resource Management Agreements are issued pursuant to the Integrated Resource Management and Tenure Administration.

AREA: As defined in the legal description schedule. (Those lands classified as Integrated Use Management Areas under the Land Use Plan that have potential Timber Harvesting and Range designations).

GRANT OF LEASE: The Lessor, on the terms set forth herein, hereby demises and leases to the Lessee the Land, save and except those portions of the Land that consist of trails, roads, highways, water courses, or that are covered by water at the date here of, for the purpose described in the attached schedule (hereinafter called the 'Special Proviso Schedule').

TERM: To have and to hold the Land unto the Lessee for a term of _____ commencing on _____; renewable every _____.

CONSIDERATION: Yielding and paying therefore for the term the dividend as prescribed in the rental schedule attached.

COVENANTS OF THE LESSEE:

- Standard clauses
- Subject to the Land Use Planning Act requirements
- Subject to the Forest Practices Act

ASSIGNMENT: The Lessee shall not assign, mortgage or transfer this lease without the prior written consent of the Lessor (this clause will also be in the legislation).

The Lessee may only enter into Resource Management Agreements authorized by and pursuant to the Resource Management and Tenure Administration Act.

The Forest Resources Corporation shares are to be held by the Ministry of Renewable Natural Resources, and cannot be assigned.

STANDARD PROVISIONS:

AUDITS: A statutory obligation of the Forest Resources Corporation and holders of Resource Management Agreements as defined in the Resource Management and Tenure Administration Act.

EVENTS OF DEFAULT:

Standard Clauses;
Statement of penalties detailed in the enabling Act.

SECURITY:

NOTICE:

MISCELLANEOUS:

INTERPRETATION:

OTHER STANDARD CLAUSES:

RESERVATIONS: The Minister of Renewable Natural Resources reserves all land rights not specifically given. This will include, but not be limited to:

- access for travel, recreation, hunting and fishing
- access for roads for work and protection
- mineral and energy exploration
- maintenance and enhancement of fish and wildlife
- the right to provide other (similar) authority such as for grazing, guiding, trapping

FOREST MANAGEMENT: The Resource Management Agreement holder shall:

- follow sound forestry practices as detailed in the Forest Practices Act.
- incorporate the management guidelines for map area _____ of the Local Land Use Plan for _____.
- give due regard to the policy of sustained yield forestry.
- develop plans that will include tangible, measurable and auditable performance standards.
- report, through an independent audit of the above performance, every _____ years, or upon notice of such requirement by the Chief Forester.
- provide long-term plans (for a complete rotation) illustrating the maintenance or enhancement of such values as required in the Land Use Plan; these plans shall include the impact of harvesting on those values through time.
- detail agreements and consultations with other RMA holders.

FOREST RENEWAL: Each RMA will contain plans for:

- replanting
- maintaining diversity of species, in accord with the appropriate biogeoclimatic zone and the Land Use Plan.
- potential intensive silviculture.

Agreements for measuring the impact of intensive silviculture will be required as part of support for expanded allowable cut.

Penalties for non-compliance will be established within the enabling legislation.

PROTECTION: Designation of responsibilities.

MODIFICATION OF THE AGREEMENT: Minor Allowance (___%) for reallocation by the government for other uses.

Detailed plan for compensation for all directly affected contractors, employees and RMA holders for changes to the Land Use Plan that are incompatible with R.M. Agreements.

Remedies and compensation to include the allocation of a commensurate forest land base and/or financial compensation.

DISPUTE RESOLUTION MECHANISM: In the event of a dispute between the FRC and the RMA (timber) holder, or between RMA holders, the following dispute resolution mechanism shall apply:

- between RMAs, recourse will be to the Appeal Board established under the Land Use Commission via the Land Use Planning Act.

SURVEY: The RMA (timber) holder is responsible for submission of a survey plan to the standards specified by the Surveyor General. The relevant Land Use Plan and explanatory text shall be attached to the Agreement.

COVENANTS:

- standard clauses
- subject to the Land Use Planning Act requirements
- subject to the Forest Practices Act requirements

Sample Document, for illustrative purposes only

B. RESOURCE MANAGEMENT AGREEMENT - TIMBER HARVESTING

BETWEEN:

THE FOREST RESOURCES COMMISSION (FRC)

AND

THE XYZ FOREST LAND MANAGEMENT COMPANY

PURPOSES: To provide a secure form of tenure and stewardship obligations for the harvesting of timber and management for all forest values in the prescribed area.

To ensure forest harvesting and management practices are fully integrated with other Resource Management Agreements and other resource values as identified in the _____ Land Use Plan and the Forest Practices Act (FPA).

AREA: As described in the legal description schedule attached. Relationship to other values and RMAs defined; maps from Land Use Plan attached.

GRANT OF MANAGEMENT: The Forest Resources Corporation, on the terms set forth herein, hereby contracts to the _____Company, Resource Management Agreement # _____, the rights to harvest and manage the forest resources as specified in the management schedule attached. The RMA does not provide exclusive use of the land but does provide exclusive access to the timber subject to the Land Use Plan (plan number _____) and restrictions identified in accordance with the full enjoyment of the rights conferred to the Resource Management Agreement holders identified in Schedule _____attached in the maps attached as Schedule _____.

TERM: To have and to hold the Resource Management Agreement for a term of ___ commencing on _____, renewable after _____, (limited by the term of the Head Lease less at least one day).

ASSIGNMENT: The Resource Management Agreement (timber) holder shall not assign, mortgage or transfer the rights of the RMA without the written permission of the lessor.

Include provisions to permit use of the Agreement for security in financial arrangements without the consent of the Forest Resources Corporation.

AUDIT: Terms related to performance as per statute, including remedies for non-performance such as :
* specified actions and time frames to remedy minor defaults
* cash penalties
* cancellation of agreement

RENT: Rent shall be collected in two forms:
* base rent for the tenure and the access to the land and the resource(timber).
* resource rent for the resource extracted.

The resource rent (stumpage) will be tied to prices in the proposed province-wide log market.

RIGHTS: The Resource Management Agreement provides the right to establish, grow and harvest timber on a specified area under map _____ of the _____ Local Land Use Plan.

MANAGEMENT PLAN: The plan will contain:

A. PLAN TEXT

*OVERVIEW: an overview of the plan area and specifically the contribution this plan area will make to sub-regional and regional land and resource management objectives.

* a general reference to the _____Sub-Regional Land Use Plan within which area this tenure falls and adherence to the land allocations and resource management prescriptions of the plan. *(note: there is a hierarchy of plans from the general to the specific--a regional plan would specify resource management targets, principles, objectives, etc.; a sub-regional plan would identify resource priority areas and general allocation and management prescriptions while the management plan of which there could be many within a sub-regional area would identify the specific resource prescriptions).*

*MANAGEMENT PRESCRIPTIONS BY DESIGNATIONS: a description of the prescriptions for management that are to occur within the various designations contained in the plan; for a specific cut block this may prescribe timing of cut, method of cut, replanting and silvicultural treatments, prestocking performance standards for audit measurement. For areas that have other predominant uses it will prescribe how these resources are to be managed. For wildlife it may include habitat enhancement activities, habitat protection, corridor protection, etc. For public recreation it may include prescription of access trails, timing of activities to minimize conflict of noise and space, viewscape protection. Grazing areas will specify range improvement requirements, fencing, stocking levels, timing etc. .

*RESOURCE MANAGEMENT AGREEMENT: For the timber tenure there will need to be a specific section on rights and obligations including specific measures of performance that are auditable. This may include: volume to be harvested, soil protection measures, clean up provisions, restocking, road and access management, timing of cut, measures taken to enhance wildlife, etc.

* for each of the other RMA tenures specific sections will be developed in a similar manner.

*the specific rights and obligations will be clearly spelled out to establish a basis for audit and for action on remedies.

PLAN SIGN-OFF: *(The sub-regional plan which establishes resource priorities will be signed off by the Land Use Commission. A management plan will be signed off at an executive level of the planning organization. Rights of appeal of any direct or third party interest will be established.)*

PLAN MODIFICATION PROCESS: As per the Integrated Resource Management and Tenure Act and the Land Use Planning Act.

PLAN REVIEW PROCESS:

DISPUTE RESOLUTION: As per the Land Use Planning Act.

B. MAPS

*background maps that depict resource values--such as capability maps for range, timber production, wildlife, fisheries, recreation, etc.

*suitability maps for various uses (the uses will have been defined in the sub-regional level of planning).

*a detailed management plan (designation map) for the tenure area: possible scales are 1:20,000 (only for small tenure) or 1:50,000. Presumably the sub-regional plan will have been done at 1:250,000. A combination will likely be required for effective planning, public consultation, and for engineering. The management plan will identify:

*cut blocks, access to these block, and timing for cut

*areas to be protected for watershed management

*protected wildlife areas

*recreation areas and access (both commercial and public) etc.

This Plan will be attached to each of the RMAs. Thus when the plan is changed, which will involve a negotiated process with rights of appeal, the rights and obligations of each of the RMAs will be amended.

Sample Document, for illustrative purposes only

C. RESOURCE MANAGEMENT AGREEMENT - TRAPPING

BETWEEN:

FOREST RESOURCES CORPORATION

AND

XYZ WILDLIFE MANAGEMENT (TRAPPER)

PURPOSES: To provide a secure form of tenure for the harvesting and management of fur resources within the prescribed area

To ensure fur harvesting and management practices are fully integrated with other resource values as identified in the _____ _____ Sub-Regional Land Use Plan

AUTHORITY: The Resource Management Agreement is issued pursuant to the Resource Management and Tenure Administration Act. (RMTAA)

AREA: As described in the legal description schedule attached.

GRANT OF TENURE: The Forest Resources Corporation on the terms set forth herein, hereby demises and contracts to XYZ WILDLIFE MANAGEMENT (TRAPPING) the rights to harvest and manage for fur bearing animals as specified in the management schedule attached. The contract does not provide exclusive use of the land but does provide exclusive access to the fur resources.

TERM: To have and to hold Resource Management Agreement (trapping) # _ for a term of _____ commencing on _____.; renewable every _____years.

ASSIGNMENT: The contractor (trapping) shall not assign, mortgage, or transfer the contract without the written permission of the Forest Resources Corporation.

AUDIT: The Forest Resources Corporation will audit from time to time but no less once every five years the performance of the contractor with respect to the obligations of this contract. Subject to the RMTA Act remedies for non-performance will consist of:

*specified actions and time frames to remedy minor defaults
*cash penalties
*cancellation of tenure

RENT: Rent shall be collected in two forms:

*base rent for the tenure and the access to the land and resources it provides
*resource rent for the resource extracted

ANNUAL REPORT: The contractor (trapping) will submit an annual report on management activities, harvest levels etc. as specified by the Forest Resources Corporation.

MODIFICATION OF THE AGREEMENT: The Forest Resources Corporation may open this contract to review on 60 days notice and/or on the review of the _____Sub-Regional Land Use Plan. In the event that this review results in a withdrawal of lands from harvesting in excess of 10% of the total volume available within this tenure then compensation is payable by the beneficiaries of the withdrawal. Compensation will be determined as per the provisions of the RMTA Act.

DISPUTE RESOLUTION MECHANISM: In the event of a dispute between the Forest Resources Corporation and the contractor or between Resource Management Agreement holders, the dispute resolution mechanism detailed in the Land Use Planning Act under provisions for an Appeal Board will apply.

MANAGEMENT PLAN: As defined for a Resource Management Agreement in the RMTA Act and the _____ Local Land Use Plan. The map requirements will be similar to those discussed in B. for the Resource Management Agreement (Timber).

Appendix 8

BACKGROUND PAPERS

The Forest Resources Commission had research papers prepared on various subjects which it reviewed under its Terms of Reference. These background documents are contained in eleven separate volumes. They were distributed to all regional, college and university libraries throughout the province. The titles and volumes are listed below.

BACKGROUND PAPERS - VOLUME 1

Reforming the Decision Making Process for Forest Land Planning in British Columbia

- Dr. Thomas Gunton and Dr. Ilan Vertinsky

Methods of Analysis for Forest Land Use Allocation in British Columbia:
Options and Recommendations

- Dr. Thomas Gunton and Dr. Ilan Vertinsky

The Use of Environmental Impact Assessment in Forest Planning and Management

- Dr. Julian A. Dunster

Multiple Use of Forest Lands: The Role of Rangeland

- G.C. Van Kooten

An Evaluation of Public Participation in the British Columbia Ministry of Forests

- Kim Brenneis

Organization and Structures of Crown Land Planning in Selected Jurisdictions

- Dr. Michael M'Gonigle, Dr. Thomas Gunton, Garry Thorne (Editor), Kim Brenneis, Jan Campfens, Wayne Clissold-Hoyle, John Fox, Timo Makinen, John Nyboer, Colin Rankin, Mailis Valenius, and Ed Van Osch

BACKGROUND PAPERS - VOLUME 2

Gaining Insight into Forest Land Use Conflicts with Decision Analysis
- T. McDaniels, PHD

The Use of Cost Benefit Analysis to Allocate Forest Lands Among Alernative Uses
- W.T. Stanbury, Dr. Ilan Vertinsky, and H. Thille

A Review of the British Columbia Crown Land Allocation and Management Planning Process
- Dorli M. Duffy

Multiple Accounts Analysis and Evaluation of Forest Land Use Conflicts
- Dr. Thomas Gunton, G.C. Van Kooten, and S. Flynn

Economic Valuation of Non-Market Values for Forest Planning
- Dr. Thomas Gunton

Toward Sustainable Water Planning and Management in British Columbia
- Dr. J.C. Day and J.A. Affum

BACKGROUND PAPERS - VOLUME 3

Management Performance on Forest Tenure, Summary of Findings

Review of Forest Tenures in British Columbia
- Sterling Wood Group Inc.

A History of Forest Tenure Policy in British Columbia 1858-1978

BACKGROUND PAPERS - VOLUME 4

Managing British Columbia's Forest Resources: Structural Alternatives, Financial Considerations and Valuation Estimates

- CWC Canadian Western Capital Ltd.

Local Employment Impacts of the Forest Industry

- Garry Horne and Charlotte Penner (Ministry of Finance and Corporate Relations)

The Provincial Economic Impacts of a Supply Reduction in the British Columbia Forest Sector

- Garry Horne, Nick Paul, and David Riley (Ministry of Finance and Corporate Relations)

BACKGROUND PAPERS - VOLUME 5

Data on the Corporate Concentration of Harvesting Rights, Manufacturing Capacity and Ownership in the B.C. Forest Industry

- Nawitka Resource Consultants

Forest Resource Management Alternatives Study

- Fortrends Consulting, Clayton Resources Ltd., Robinson Consulting & Associates Ltd.

BACKGROUND PAPERS - VOLUME 6

Preliminary Assessment of Forest Related Tourism Values

- Woodbay Consulting Group Limited

Adventure Travel and Land Use

- Pacific North Consulting

BACKGROUND PAPERS - VOLUME 7

Report on the Current Status of Forest Resource Inventories of British Columbia

A Summary of Technical Reviews of Forest Inventories and Allowable Annual Cut Determiniations in British Columbia

- HST Consortium

BACKGROUND PAPERS - VOLUME 8

Timber Harvesting

- J.P. (Hamish) Kimmins

BACKGROUND PAPERS - VOLUME 9

Computer Searches of Major Themes and Related Issues for the Issue/Options Paper, Future of Our Forests, Volume 1

- Praxis and Salasan Inc.

BACKGROUND PAPERS - VOLUME 10

Computer Searches of Major Themes and Related Issues for the Issue/Options Paper, Future of Our Forests, Volume II

- Praxis and Salasan Inc.

Supplemental Searches for the Issue/Option Paper

- Praxis and Salasan Inc.

BACKGROUND PAPERS - VOLUME 11

Options Workshop Summary

- Salasan Associates Inc. and Praxis

Appendix 1: Creston

Appendix 2: Harrison Hot Springs

Appendix 3: 108 Mile House

Appendix 4: Parksville

Appendix 5: Prince George

Appendix 6: Terrace

Appendix 7: Vernon

Analysis of Public Response to the Option Paper "The Future of Our Forests"

- Praxis

Appendix 9
COMMISSIONERS

A.L. (Sandy) Peel – Chairman

Sandy Peel was appointed Chairman of the British Columbia Forest Resources Commission on October 11, 1989. He has extensive experience in both the private and public sectors and most recently held the positions of Deputy Minister of Education (1987 - 1989) and Deputy Minister of Economic Development (1974 - 1987) with the Provincial Government. Mr. Peel, who holds a B. Comm. from U.B.C. and an M.B.A. from Berkeley, was responsible for economic development and trade policies and for developing and implementing major education reforms arising from the Sullivan Royal Commission on Education during his career as a Provincial Deputy Minister.

Peter Burns, Q.C. – Vice-Chairman

Peter Burns is Professor and Dean of the Faculty of Law at the University of British Columbia. He has a wide range of professional interests, including environmental protection, regulation of economic interests, and international human rights. Dean Burns has extensive experience in professional services and consultancies on a wide range of legal issues. Under his direction, the Law Faculty has developed an extensive Asian law program and redirected its curriculum to reflect the changes in the economy and aspirations of British Columbians.

Collier Azak

Collier Azak, of Gitwinksihlkw, is a member of the Nishga'a Tribal council and President of Zaul - Zap Industries (1983) Ltd. of Canyon City, a forest company based in the Nass River valley. He is a forest technician and forest resource person for the Nishga'a Tribal council.

Roger Freeman

Roger Freeman M.D. is a clinical professor of psychiatry at the University of British Columbia and Chairman of the Recreation and Conservation Committee of the Federation of Mountain Clubs of British Columbia. He is also a director of the Outdoor Recreation Council and co-chairman of the Forest Land Use Liaison Committee. Dr. Freeman has co-authored several books on hiking trails in B.C. and Arizona, his first being *Exploring the Stein River Valley* published in 1979.

Joyce Harder

Joyce Harder is Mayor of Lillooet, a businesswoman and pilot. She has served in key executive positions in the Okanagan Mainline Municipal Association and with the Union of B.C. Municipalities, and served on the Regional District of Squamish-Lillooet Hospital Board. Mayor Harder is very much aware of the role of the forest industry in regional and municipal economies. She has taken a keen personal interest in small business forestry value-added initiatives and in public education relating to forestry issues. She also spearheaded the drive to have Lillooet declared the "Forestry Capital of B.C." for 1989.

David Haywood-Farmer

A rancher from Savona, David Haywood-Farmer is President of the Tunkwa Lake Stock Breeders' Association. He has been a member of the B.C. Cattlemen's Association for six years and chairs its public relations committee. Mr. Haywood-Farmer holds a Bachelor of Science degree in agriculture from the University of British Columbia.

Robert W. Kennedy

Dr. Bob Kennedy was dean of the University of British Columbia's Faculty of Forestry from 1983 - 1990. Between 1955 and 1961, and again from 1979-1983, he was a member of the UBC Faculty of Forestry, teaching and conducting research in wood science and wood utilization. Dr. Kennedy served as assistant and associate professor at the University of Toronto from 1962 to 1966. Between 1966 and 1979, he held several posts, including deputy director (1973-1975) and director (1975-1979) of the Western Forest Products Laboratory of Environment Canada, the predecessor of Forintek Canada Corp. Dr. Kennedy is also President of the International Academy of Wood Science, an organization of about 200 elected Fellows recognized for their achievements in wood-based research.

Jack Munro

Recognized as one of British Columbia's most powerful labour leaders, Jack Munro is President of the 50,000 - member IWA-Canada. A sometimes outspoken critic of forest management polices, Munro's 27 years in IWA politics have earned him a level of respect unequalled in British Columbia's labour scene. Mr. Munro, widely recognized as a man who cares for people, has deep concern about the future of the forest industry in the province.

Carmen Purdy

Carmen Purdy is Industrial Relations Manager (pulp) for Crestbrook Forest Industries in Skookumchuck, north of Cranbrook. He has served the company for 21 years. Mr. Purdy has been Vice-President (four years) and President (two years) of the B.C. Wildlife Federation, President (10 years) of the East Kootenay Wildlife Federation, and a director (two years) of the Nature Trust. He founded the Kootenay Wildlife Heritage Fund in 1980 and has been its president since inception.

The Honourable Robert Rogers, O.C.

A former Lieutenant - Governor of British Columbia and forest industry executive, the Hon. Bob Rogers is continuing a long and distinguished business and service career in the province. A civil engineering graduate and veteran of the Second World War, he has held many positions with a wide range of business associations and service bodies. The Hon. Mr. Rogers, a resident of Victoria, is also a past-chairman of the Canadian Forestry Advisory Council.

Garry Sharpe

Garry Sharpe, the general manager of a tourist attraction in Penticton, is President of the Okanagan-Similkameen Tourism Association, a position he has held for five years. Prior to 1985, he served as vice-president and director of the association. Sharpe has also served as charter vice-president (1987-1988) of the Council of Tourism Associations of B.C., and a member (1985-1987) of the Provincial Tourism Advisory Council.

Cyril Shelford

A former Cabinet Minister and Member of the Legislative Assembly who served his constituents for 24 years, Cyril Shelford has a broad background in natural resource management as a businessman, politician and consultant. He has also served as a representative of the Tourist Association of British Columbia and the North West Loggers Association. As well, Mr. Shelford recently conducted inquiries into the management of Peregrine Falcons and into the British Columbia Milk Board.

John Szauer

John Szauer, a B.C. registered professional forester, has 30 years of experience in technical and professional forestry, primarily in forest inventory, timber pricing, harvesting administration, and reforestation and silviculture, including limited nursery work. Mr. Szauer, a resident of Williams Lake, was a senior manager in the British Columbia Forest Service for several years, retiring recently from the position of Regional Manager, Cariboo Forest Region. Szauer is currently self-employed as a consultant.

Appendix 10

LIST OF PARTICIPANTS

The Forest Resources Commission received briefs, letters and/or oral presentations from the following individuals, firms and organizations. The Commission was also helped in its deliberations by the many unsigned questionnaire responses to its Options Paper and by briefs and letters received without names and/or addresses.

Organizations are listed by name of organization rather than an individual representative.

The omission of the name of any individual or organization that should appear on this list is unintentional.

"A" Team Industries Ltd.	Port Alberni
Abel, Gus/Tyax Mountain Lake Resort	Gold Bridge
Abbott, Roy A.	Surrey
Abear, Robyn	Revelstoke
Ainsworth Lumber Ltd.	Lillooet
Aitken, Neil	Gabriola Island
Akrigg, Helen Manning	Vancouver
Alberni Environmental Coalition	Port Alberni
Albers, Leslie	Victoria
Albrecht, J.C.	Naramata
Alexander, Michael L., RPF	Gibsons
Allen, Cathie	Quesnel
Allen, R.	New Denver
Alliance Tribal Council	Vancouver
Allison, Angus P., RPF	North Vancouver
Alpine Club of Canada	Victoria
Alton and McFarlane Logging Ltd.	Sandspit
Amanovich, Andy, RPF	Mission
Amyoony. Peter	Dunster
Anahim Lake Cattlemen's Association	Anahim Lake
Anaka, Gary	Nanaimo
Anchikoski, Walter	Prince George
Andersen, Sven E.	Vancouver
Anderson, A.M., B.Sc.A.	Savona
Anderson, Dale W.	Nelson
Anderson, Harvey M.	Prince George
Anderson Lake Indian Band	D'Arcy
Anderson, L.E. (Les), RPF	Rosedale
Anderson, Lee	Prince George
Anderson, R.J.	Savona
Anderson, Sandie	Cranbrook
Anderson, Dr. Tom	Summerland
Anderson, Mr. & Mrs.	Quesnel
Andre, Jacques	Vancouver
Andreeff, Ernie	Qualicum Beach
Anthony, Leiani	Gibsons
Antle, Greg, RPF	Edinburgh, Scotland
Antonelli, Alice F.	Errington
Antonenko, James	Williams Lake
Applegrove Residents Environmental Association	Fauquier
Applied Science Technologists and Technicians of British Columbia	Burnaby
Arajs, Andrej	New Denver
Arishenkoff, Marcie	Canal Flats
Arkesteyn-Vogler, Andrew	Clearbrook
Armleder, Duke	Jaffray
Arngtt, K.	Prince George
Arnott, Casey	Vancouver
Aronsson, Mr. and Mrs. David A.	Charlie Lake
Arrow Lakes Environmental Alliance	Nakusp
Arter, Judy	East Kelowna
Arthur, Gordon	Gibsons
Ashmore, Edward E.	Fernie
Association of British Columbia Irrigation Districts	Vernon
Association of British Columbia Professional Foresters	Vancouver
Association of British Columbia Professional Foresters - North Island Regional Public Affairs Committee	Vancouver
Association of Chute Lake Cabin Owners/Ted Ritchie	Naramata

Association of Professional Biologists of British Columbia	Vancouver
Association of Whistler Area Residents for the Environment (AWARE)	Pemberton
Ashton, Roger	Vancouver
Atco Lumber Ltd.	Fruitvale
Atherton, Mark V.,RPF	Victoria
Atkinson, G.	Kamloops
Atwood, Sylvia and Bruce and Harry Jones	Surrey
Aubrey, Elisabeth	Crescent Spur
Avis, Donald P., RPF	Chemainus
Avis, Richard	Port Alberni
Ayers, Maurice J., RPF	Victoria
B.C. Environmental Information Institute	Vancouver
B.C. Fishing Resorts and Outfitters Association	Kamloops
B.C. Forestry Association - Kootenay Regional Office	Cranbrook
B.C. Government Employees' Union	Burnaby
B.C. Hydro and Power Authority	Vancouver
B.C. Institute of Agrologists	Abbotsford
B.C. Ministry of Agriculture and Fisheries	Victoria
B.C. Ministry of Crown Lands	Victoria
B.C. Ministry of Education	Victoria
B.C. Ministry of Energy, Mines and Petroleum Resources	Victoria
B.C. Ministry of Environment	Victoria
B.C. Ministry of Finance and Corporate Relations	Victoria
B.C. Ministry of Forests	Victoria
B.C. Ministry of International Business and Immigration	Victoria
B.C. Ministry of Labour and Consumer Services	Victoria
B.C. Ministry of Municipal Affairs, Recreation and Culture	Victoria
B.C. Ministry of Native Affairs	Victoria
B.C. Ministry of Parks	Victoria
B.C. Ministry of Regional and Economic Development	Victoria
B.C. Ministry of Tourism	Victoria
B.C. Ministry of Transporation and Highways	Victoria
B.C. Trappers Association	Clinton
B.C. Wildlife Federation	Surrey
B.C. Wood Specialties Group	Vancouver
B.V.R. Contractors Ltd.	Chase
Babine Forest Products Company	Burns Lake
Bablitz, William	Campbell River
Back Country Horsemen of B.C.	Aldergrove
Bacon, Don M.	Vancouver
Baker, Ralph	Vernon
Bako, J.Z., RPF	Vancouver
Balfour, Bob and Roberta/ Roche Lake Resort	Kamloops
Balke, Dr. J.M.E.	Nanoose Bay
Ballantyne, Jane	Lillooet
Ballantyne, Jim, RPF	Sicamous
Barber, Alan G., F.I.T.	Gibsons
Barkley, Ann	Slocan City
Barnes, C. Jean	Victoria
Barnes, Pauline	Victoria
Barnes, Thomas D.	Victoria
Barnhardt, Kerry	Chase
Barr, Blair T., RPF	Telkwa
Barrett, Laurel	Lasqueti Island
Barron, Mansell	Kamloops
Basaraba, Dave	Cranbrook
Basaraba, George	Beaver Cove
Basaraba, Susanna	Cranbrook
Basic Forestry Ltd.	New Westminster
Geoff Bate & Associates	Saanichton
Bawtree, Len	Enderby
Beach, Russell E.	New Westminster
Bebb, David C., RPF	Vancouver
Beduz, Mrs. L.B.	Creston
Behn, Elmer	Port Alberni
Behn, Maria	Port Alberni
Bell, Denys	Burns Lake
Bell, Warren	Salmon Arm
Bell Pole Company Ltd.	Lumby
Bellows, E.A.	Salmon Arm
Bennett, David	Victoria
Bennett, Douglas M., RPF	Coquitlam
Berekoff, Fred J., RPF	Prince George
Bergenske, John	Skookumchuck
Bergevin, Marion	New Denver
Bernson, Rebecca	Victoria
Bertramm, Devon	Port McNeill
Bertramm, J.G.	Port McNeill

Betuzzi, Chris	100 Mile House
Big Creek Ad Hoc Study Group	Big Creek
Big Lake Ranch/Richard Case	Big Lake
Billmark, Gary G.	Cranbrook
Bilous, Jo-Anne	Prince George
Billows, E.A.	Salmon Arm
Bird, Linda	McBride
Birnie, Lynn	Burnaby
Blackstock, Michael, RPF	Victoria
Blackwater-Ootsa Community Association	Coquitlam
Blackwell, Gary	Burns Lake
Blazina, Norman	Salmon Arm
Blix, Einar	Smithers
Blom, Frank	Kamloops
Blom, G.	Ganges
Bobtail Ranch Ltd.	Penticton
Bodegom, Volker	Vancouver
Boepple, W. Wilhelm	Victoria
Bohlen, Jim	Denman Island
Bonny, Russell, B.Sc., NRM	Coquitlam
Borkent, Art, Ph.D.	Salmon Arm
Borsato, Robert A. and Cathie Allen	Quesnel
Borus, Stephen	Surrey
Bourdillon, Bill	Campbell River
Bostock, M.	Cranbrook
Bostock, Maureen	Terrace
Bourdillon, Bill	Campbell River
Bowden, J.D.	Cranbrook
Bowman , M. Colleen	New Denver
Boydston, Herschel H., RPF	Delta
Box Mountain Watershed Association	Nakusp
Boyes, David	Courtenay
Bradley, Roy and Lois	Sicamous
Bradley, Vivien and Lorne	Sicamous
Bragg, Doug	Lillooet
Bralorne Committee for Responsible Logging	Bralorne
Brandon, L.V.	Saanichton
Brandon, William	Saanichton
Brass, Sid	Creston
Brenton, Dick	Argenta
Bresser, Todd	Smithers
Brett, John	Yalakom
Bridge Creek Estate	100 Mile House
Bridges, Allan and Mary Jo	Richmond
Briere, Janette	Nanaimo
Briggs, Alexander G., Ph.D.	Victoria
British Columbia Cattlemen's Association	Kamloops
British Columbia Forestry Association	Vancouver
British Columbia Future Forests Study Group	Vancouver
British Columbia Society of Landscape Architects	Vancouver
Broadworth, Ambec	100 Mile House
Broeren, Martin	Campbell River
Brons, Grant J.	Cranbrook
Brooks, Allan C. and Betty	Black Creek
Brophy, Lyla	Vanderhoof
Broughton, Jeff and Heather	Shawnigan Lake
Broughton Towing Co. Ltd./ Ridgeway W. Wilson	Duncan
Brouwer, R.A.L.	Vancouver
Brower, David	Vancouver
Brown, Boyd	Smithers
Brown, Cherry and Jim Valgows	Dunster
Brown, Don	Revelstoke
Brown, Ian D.	Victoria
Brown, Margaret, M.D.	Victoria
Brown, Murray	Langley
Brown, Robert	Terrace
Brown, Susan	Lillooet
Bruce, Kaeleen	Terrace
Brummelhuis, Richard	Fruitvale
Brunelle, Roger	Cranbrook
Buchanan, Melda	Comox
Bulkley Valley Naturalists	Smithers
Bull, Gary	Vancouver
Burbee, J.W., RPF	Prince George
Burch, W.G., RPF	Richmond
Burchnall, Keith D.	Valemount
Burns, Bruce R., P.Eng	Cranbrook
Burgess, Jim	Port Hardy
Burns, Stephen	Surrey
Burrows, Wendy	Nanaimo
Burton, Philip J., Ph.D.	Vancouver
Butula, Jack	Vernon
Bydemast, Irma	Surrey
Byford, Randy	Cranbrook
C to C Tours and Travel Consulting	Victoria

Caduff, Elvira	Surrey
Callahan, Mikell	Burns Lake
Caldwell, Ian	Saanichton
Camen, Lance Lee	Victoria
Lorne W. Camozzi Co. Ltd.	Revelstoke
Campbell, Jim	Cranbrook
Canada Cedar Pole Preservers Ltd.	Galloway
Canada Fisheries and Oceans - Pacific Region	Vancouver
Canadian Forest Products Ltd. - Chetwynd Division	Chetwynd
Canadian Forest Products Ltd. - Coast Forest	Vancouver
Canadian Forest Products Ltd. - Englewood Logging Division	Woss
Canadian Forest Products Ltd. - Northern Operations-Wood Products	Prince George
Canadian Institute of Forestry - B.C. Coordinator/ K.J. McGourlick, RPF	Holberg
Canadian Institute of Forestry - Okanagan Section	Lumby
Canadian Institute of Forestry - Cariboo Section	Prince George
Canadian Institute of Forestry - Pacific Section	Port Alice
Canadian Institute of Forestry - Vancouver Section	Vancouver
Canadian Nature Federation	Ottawa
Canadian Pacific Forest Products Inc.	Victoria
Canadian Pacific Forest Products Limited - Tahsis Pacific Region	Vancouver
Canadian Parks and Wilderness Society	Victoria
Canadian Parks Service (Mount Revelstoke and Glacier National Parks)	Revelstoke
Canadian Women in Timber, Campbell River Branch	Campbell River
Canadian Women in Timber, Kootenay Branch	Cranbrook
Canadian Women in Timber - National Board	Vancouver
Canadian Women in Timber - Top of the Island Branch	McNeill
Canadian Women in Timber - West Coast Branch	Ucluelet
Canim Lake Indian Band Council	100 Mile House
Cann, Dave	Port McNeill
Capes, Katherine	Courtenay
Capes, P.M.	Comox
Capling, Steve	Alexis Creek
Cariboo Cattlemen's Association	McLeese Lake
Cariboo-Chilcotin Guides & Outfitters Association	Williams Lake
Cariboo Environmental Committee	100 Mile House
Cariboo Horse Loggers Association	Quesnel
Cariboo Lumber Manufacturers Association	Williams Lake
Cariboo Pulp & Paper Company	Quesnel
Cariboo Regional District	Williams Lake
Cariboo Rose Guest Ranch	Clinton
Cariboo Tourist Association	Williams Lake
Cariboo Woodlot Association	150 Mile House
Carlson, Michael, Ph.D.	Vernon
Carrier Lumber Ltd.	Prince George
Carrier Sekani Tribal Council	Prince George
Carroll-Hatch (International) Ltd.	N. Vancouver
Carson, Gordon	Valemount
Carter, Boyce F.	Salmon Arm
Carter, Catherine	Tumbler Ridge
Cartwright, Andrew, C.A.	Victoria
Case, Richard	Big Lake Ranch
Cattlemen's Association	Houston
Cavera Timber Ltd.	Anmore
Celgar Pulp Company	Castlegar
Central Coast Economic Development Commission	Hagensborg
Central Coast Environment Group/ Land Use Section	Hagensborg
Central Fraser Valley Water Commission	Mission
Central Interior Logging Association	Prince George
Chakowski, Colin A.	Cranbrook
Chambers, Alan	Vancouver
Chen, Frederick	Vancouver
Chenoweth, Robert	Kamloops
Chernoff, W.W.	Vancouver
Chester, S.G., RPF	West Vancouver
Chetwynd Chamber of Commerce	Chetwynd
Chilanko Ranch	Redstone
Chilcotin Information Network	Anahim Lake
Chilibeck, Terrance and 44 others	White Rock
Chilko Forestry Services	Williams Lake
Chilliwack Field Naturalists	Vedder Crossing

Chilliwack Outdoor Club	Vedder Crossing
Chipman, Marlene	Creston
Chittick, John G., RPF	Port McNeill
Chown, Robert	Comox
Christina Lake Watershed Alliance	Christina Lake
Ciejka, Larry	Prince George
Citizens for Public Justice	Burnaby
City of Castelgar	Castlegar
City of Cranbrook	Cranbrook
City of Kamloops	Kamloops
City of Kelowna and Regional District of Central Okanagan	Kelowna
City of Kimberley	Kimberley
City of Nelson	Nelson
City of Prince Rupert	Prince Rupert
City of Quesnel	Quesnel
City of Revelstoke	Revelstoke
City of Rossland	Rossland
City of Terrace	Terrace
City of Terrace Forestry Advisory Committee	Terrace
City of Vernon	Vernon
City of Williams Lake	Williams Lake
Clark, James D., RPF, B.S.F.	Nanaimo
Clark, William H.	Calgary
Clarke, Allan L.	Vancouver
Clarke, Bruce	Vernon
Clarke, John F.	Dawson Creek
Classen, Mark and Shannon	Ganges
Clay, Ian R.	Salmon Arm
Clear Cut Alternatives	Galiano Island
Clearwater Forest District Public Advisory Committee	Clearwater
Clifford, B.J.	Cranbrook
Clifford, Jim	Hazelton
Clift, F.R.	Penticton
Clinton Cattlemen's Assoc	Clinton
Clogg, Wayne, RPF	Prince George
Coalition for Information on Pulpmill Expansion	Castlegar
Coastal Cruising Supervisors' Task Force	Vancouver
Coldwater Indian Reserve	Merritt
Colebank, Paul	Williams Lake
Collier, Thomas A.	Quesnel
Collins, J.R., RPF	Vancouver
Columbia River Valley Trappers' Association	Golden
Comox Strathcona Natural History Society	Courtenay
Committee for a Clean Kettle Valley	Rock Creek
Communist Party of Canada	Victoria
Communist Party of Canada - Kamloops Club	Kamloops
Community Forest Steering Committee (Cowichan Valley)	Duncan
Condale Industries	Lumby
Condie, Chris	100 Mile House
Conroy, Sharie	Mission
Consulting Foresters of British Columbia	Vancouver
Cooperman, Jim	Chase
Cooperman, Kathi	Chase
Cork, Walter	Prince George
Cortes Island Forest Resource Committee	Cortes Island
Cortese, Joe	Tatla Lake
Couch, Don, RPF	Lumby
Council for International Rights and Care for Life on Earth	Tofino
Council of B.C. Yacht Clubs	Vancouver
Council of Forest Industries (COFI) - Coast Forestry & Logging Sector	Vancouver
Council of Forest Industries of British Columbia (COFI) - Northern Interior Lumber Sector	Prince George
Coulter, Ann	Cranbrook
Coutts, Betty	100 Mile House
Craig, R.J., RPF	N. Vancouver
Cranbrook Farmers Institute	Cranbrook
Cranston, Jerome	Vernon
Creighton, John	Merritt
Crestbrook Forest Industries Ltd.	Cranbrook
Creston Area Economic Development Committee	Creston
Critical Site Logging Inc.	Vernon
Crockford, Dennis, M.I.C.For.	Comox
Roy Crombie Logging/Roy Crombie	Salmon Arm
Crosman, Jack E., Executive Assistant to John Jansen, MLA-Chilliwack	Chilliwack
Crouse, Ed	Burns Lake
Crown Land Task Force, Lasqueti Island	Lasqueti Is.

Culp, Jim	Terrace
Curll, Bruce E.	Lac La Hache
Curnock, Audrey	Chemainus
Cuthbert, Bob, A.Sc.T.	Hagensborg
Cwikula, Walter	Salmon Arm
Daniels, G.G.	Delta
Danshin, Bill & Sandi	Victoria
Dack, Brian L.	Kamloops
D'Arcy, Christopher, MLA - Rossland-Trail	Trail
Darke Lake Watershed Protection Alliance	Summerland
Darl, M.M.	Port Hardy
Dauncey, Guy	Victoria
Davidson, R.G.	Westbridge
Davidson, Robert B.	Victoria
Davies, April	Surrey
Davies, Glen	Victoria
Davies, Joyce E.	N. Vancouver
Davison, Rose	Ucluelet
Day, G.E.	Kelowna
Day, Ken, RPF	Williams Lake
Day, M.	Victoria
Deak, Joe	Dawson Creek
Deane, R.D. (Kim), P.Eng.	Rossland
DeBock, Randy	Clearwater
Decker Lake Forest Products Ltd.	Burns Lake
Decyk, Tar	Sorrento
DeFelice, Paul	Nelson
Delisle, George	Westbridge
Delsman, James	Ashland, OR
DeLuca, Wayn	Port Alberni
Denman Island Trustees and The Forestry Committee of the Denman Island Ratepayers' Assoc.	Denman Island
Derbyshire, Bill	Williams Lake
DeBock, Randy	Clearwater
DeSteur, Keegan and Mike Bele	Elkford
Dickson, John and Joan	Creston
Diggle, Paul K., B.Sc.F.	Victoria
District of Chetwynd and Area Econmic Development Commission	Chetwynd
District of Houston	Houston
District of Logan Lake	Logan Lake
District of Mackenzie	Mackenzie
District of Mission	Mission
District of North Cowichan	Duncan
District of Sicamous	Sicamous
District of Squamish	Squamish
Dobson Engineering/D.A. Dobson	Kelowna
Doherty, Michael P.	Vancouver
Dolenuck, John	Williams Lake
Domovich, John	Qualicum
Donahue, Sean, RPF	Williams Lake
Donat, Jacques P.	Kamloops
Donovan, Laurance	Vernon
Dooling, Peter J., Professor	Vancouver
Dornian, Ken	Port Alberni
Douglas, James	Victoria
Downie Street Employee Committee	Revelstoke
Downie Street Sawmills Ltd.	Revelstoke
Drosdovech, Stephen	Powell River
Drage, Harry W., RPF	Salmon Arm
Draney, Kyle	Langley
Drury, Wayne, RPF	Salmon Arm
Dubbin, Wendy May	100 Mile House
Ducks Unlimited Canada	Kamloops
Dueck, Peter	Kimberley
Dufour, Lorne	Williams Lake
Duffy, John	Vancouver
Duffy, Patrick	West Vancouver
Dumont, W.E., RPF	Port McNeill
Dunbar, Michael D., RPF	Houston
Duncanson, Karen	Victoria
Dunkley Lumber Ltd.	Prince George
Dunne, Tim, RPF	West Vancouver
Dunster Community Association	Dunster
Dunster, Julian A., Ph.D., RPF	Burnaby
Dunwell, Gordon R.	Cranbrook
Dvorak, Mrs. Frank	Fernie
Dyck, Dianne and Victor	Manson Creek
Dyck, Leonard	Vancouver
Dysart, Janet, R.N.	North Vancouver
Eagle Creek Outfitters/Gene Biltzan	Lac La Hache
Earth Day 1990	Victoria
East Kootenay Environmental Society, Elkford Branch	Elkford
East Kootenay Environmental Society, Golden Branch	Golden

East Kootenay Environmental Society	Kimberley
East Kootenay Wildlife Association	Canal Flats
Eco Forestry Services	McBride
Edal, M.M.	Port Hardy
Edwards & Associates Logging Ltd.	Richmond
Edwards, R.A. (Bob)	Sicamous
Eek, F. Dale	Rock Creek
Ehl, Rodney	Nakusp
Eichel, G.H.	Midway
Eichenauer, Richard	Fauquier
Eigelshoven, Bernhard and Eroca Ryon	Anglemont
Elinsky, Richard	Surrey
Elk Valley Conservation Society	Fernie
Elk Valley Integrated Forestry Task Force	Fernie
Elkford Elementary School Grade 5 Social Studies Class	Elkford
Elliott, Marie	Victoria
Embury-Williams, B. Lynn, RPF	Vancouver
Endacott, Rod	100 Mile House
Environment Committee of the University Women's Club	Kelowna
Environmental Educators' Provincial Specialist Association	Errington
Epics Technologies Ltd.	Vancouver
Epp, Ken and Kay	Cranbrook
Epp, Larry	Campbell River
Erhorn, Walter	Williams Lake
Erickson, Larry	Manson Creek
Erkiletian, Jim	Gabriola Island
E.S.R. Holdings Ltd./E.S. (Bert) Reid, RPF, P.Eng.	Qualicum Beach
Esson, Heather	Langley
Eurocan Pulp and Paper Ltd.	Fraser Lake
Evans Forest Products Ltd.	Golden
Everall, Archie and Garth	Prince George
Evins, George/Evins Contracting Ltd.	Castlegar
Eyres, S.	Slocan Park
Fage Creek Ranch	Clearwater
Farrell, Caroll	Vancouver
Faulks, Eric A.	Edgewood
Fearing Super Drugs/R. Fearing	Gold River
Federated Co-operatives Ltd.	Canoe
Federation of British Columbia Naturalists	Vancouver
Federation of B.C. Woodlot Associations	Maple Ridge
Federation of Mountain Clubs of British Columbia	Vancouver
Feke, Arlene E.	Lantzville
Ferguson, C. Heather	Vancouver
Ferguson, Ken	Wasa
Fernie Snow Valley Ski Ltd.	Fernie
Fibermax Timber Corporation	Victoria
Fidler, Dr. Larry E.	Valemount
Findlay, Neil, B.S.F.	Coquitlam
Findlay, Jennifer	Salmon Arm
Findlay, R.	Fort St.John
Finnis, J.M., RPF	Victoria
Finning Ltd. employees	Williams Lake
Fiorentino, Joan	Cranbrook
First Nations of South Island Tribal Council	Mill Bay
Fleet, Ken and Rose	Okanagan Falls
Flegel, David A., R.P.Bio.	Bella Coola
Fletcher, Barry	Cranbrook
Fletcher Challenge Canada Ltd. - Bella Coola Operations	Hagensborg
Fletcher Challenge Canada Ltd. - Coast Wood Products	Vancouver
Fletcher Challenge Canada Ltd. - Pope & Talbot - Williams Lake Division	Williams Lake
Fletcher Challenge - Southern Interior Wood Products	Kelowna
Fletcher Challenge - Northern Interior Wood Products/ Finlay Forest Industries Ltd.	Prince George
Floyd, J.B.	Vancouver
Flynn, Shawn	Vancouver
Foisy, Wayne/Condale Industries	Lumby
Folk, Scott A., RPF	Vancouver
Fontaine, W.A.	Errington
Foothills Woodlot Association	Chetwynd
Forest Engineering Research Institute of Canada - Western Division (FERIC)	Vancouver
Forest Watch Committee of East Kootenay Environmental Society, Kimberley-Cranbrook Branch/ Carol Hartwig	Kimberley
Federation of Mountain Clubs of B.C.	Vancouver
Folk, Scott A., RPF	Vancouver
Forestry Wildlife Symposium (Canadian Institute of Forestry)	Prince George
Foothills Woodlot Association	Chetwynd

Forintek Canada Corp.	Vancouver
Fort Nelson Trappers Association	Fort Nelson
Fort St. James Chamber of Commerce	Fort St. James
Fort St. John Trappers Association	Hudson's Hope
Fossum, Brian and Mary	Pouce Coupe
Foster, Colleen	Clearwater
Foulger, Rick	Nelson
Fountain, Wendy	Prince George
Four Wheel Drive Association of B.C.	Surrey
Fowler, Bruce	Enderby
Fox, Irving K.	Smithers
Fox, Rosemary J.	Smithers
Frame Logging Ltd.	Terrace
Franck, Muriel	Penticton
Ronald J. Frank, RPF	Merville
Fraser, Bruce	Victoria
Fraser, Claire	Anglemont
Fraser, Gloria	Kamloops
Fraser, Gerry, RPF	Qualicum Beach
Fraser Institute	Vancouver
Fraser Valley Independent Shake & Shingle Producers Association	Vancouver
Frebold, Erik	North Vancouver
Fredricksen, Robert R.	Gibsons
French, J. and A.	Salmon Arm
Friends of Clayoquot Sound	Tofino
Friends of the Environment	Burns Lake
Friends of Strathcona Park	Courtenay
Fryer, Robert	Bella Coola
Fulton, Mr.	Vernon
Funk, Edd and Irma	Meadow Creek
Funk, Werner F.	Queen Charlotte City
Fuzi, Carolyn	Port McNeill
Gagne, Louis, RPF	Vancouver
Galisky, Arlene L.	Prince George
Gallank, Don and Valerie	Port Moody
Gallart, Richard	Vancouver
Galliazzo, Paul, RPF	Williams Lake
Galliazzo, Steve and Christine	Lillooet
Gallinger, G.C. & Associates	Qualicum Beach
Ganong, R.Y.	Cranbrook
Garrard, Pat & Son/Margaret Garrard	Gold Bridge
Garrett, Larry	Vanderhoof
Gee, Brian G.	Victoria
Geisler, Mike	New Hazelton
Germansen Landing Study Area (27 signatures)	Germansen Landing
Gettings, Jackie	Langley
Gibson, John S.T.	Duncan
Gilbert, Ann-Marie	Burnaby
Gilbert, Denise	North Vancouver
Gilbert, L.S.	Nelson
Giles, Donald R., RPF	North Vancouver
Ginn, Trevor T.	Enderby
Giroday, Lesley	Fernie
Glacier Lake Logging Ltd.	Pemberton
Glenmore Irrigation District	Kelowna
Goerzen, Glen	Armstrong
Golbeck, Wendy	Port Alberni
Gold River Fuels Ltd./Cliff Craig	Gold River
Golden Alpine Holidays	Golden
Goldman, Ian	Vancouver
Goldwater Indian Band	Merritt
Gomery, Geoffrey	Vancouver
Gooch, A.D.	Victoria
Goodman, Hugh J.,RPF	Quesnel
Goodwin, Ruth	Kimberley
Gook, Douglas	Quesnel
Gordon, Mayor Donald T.	Lake Cowichan
Gore, Tom, David White and Edo Nyland, RPFs	Victoria
Gorley, Al, RPF	Houston
Gorman Bros. Lumber Ltd.	Westbank
Gortland, J.S.	Creston Valley
Grabowsky, Gabriela	Rock Creek
Grace, Eric S.	Saanichton
Graffunder, Ernie O.	Vavenby
Graham, Gina	Fort St. George
Graham, Mary	Victoria
Graham, Romeo	Winlaw
Granander, Hans	Hagensborg
Grand Forks Watershed Coalition	Grand Forks
Grau, Gerhard	McBride
Greater Vancouver Water District	Burnaby
Green Islands	Ganges
Green, Jim	Salmon Arm
Green Party of British Columbia/ Connie Harris	Salmon Arm

Green, W., RPF	Port McNeill
Grenager, Erling H.	Port Coquitlam
Griessel, J. Howard	Merville
Guernsey, G.E., D.V.M.	Victoria
Guild, Don	Kelowna
Guillemaud, John	Abbotsford
Gunn, Grant J., RPF	Vavenby
Guthrie, E.J.	Manson's Landing
Greenpeace/Kim Semenick	Vancouver
Grey, Jane, M.D.	Trail
Habart, Glen	Creston
Haberl, Kevin	Victoria
Habersack, Bernadette	Tomslake
Haddock, Philip G., Professor Emeritus	Vancouver
Hadwin, Grant	Gold Bridge
Haeussler, Sybille, RPF	Smithers
Halbert, Gary H.	Cranbrook
Haley, D.K., RPF	Duncan
Hall, Vern	Moyie
Hallatt, L.B.	Cassidy
Hallatt, Tony	Cassidy
Halliwell, Ross	Cranbrook
Hallman, Jay	Smithers
Halsey, Elaine J.	Vernon
Halurson, Dwayn	Williams Lake
Hambleton, Hugh	Cranbrook
Hamilton, Bill	Nelson
Hammond, Herb, RPF/ Silva Ecosystem Consultants	Winlaw
Hamption, Leonore	Richmond
Hampton, Bob	Likely
Handley, D.L.	Nanaimo
Hansen, Diane	North Burnaby
Hansen, Juergen	Summerland
Hansen, Ken	Manson's Landing
Hansen, Peggy	Victoria
Harany, William	Qualicum Beach
Hardy Silvicultural Contracting Ltd.	Richmond
Harper, David E., Ph.D., M.C.I.P.	Victoria
Harper, Robert A.	Dawson Creek
Harrer, Peter	Parksville
Harris, B.S.	Penticton
Harrison, Bruce	Manson's Landing
Harrison, Dave	Campbell River
Harrison, W.	Anglemont
Hashizume, Robert	Burnaby
Haskell, Sydney	Victoria
Hatch, Mary Helen	Maple Ridge
Hatfield, H.R.	Penticton
Hauta, H. Jean	Enderby
Hawes, Malcolm B.	Westbank
Hawker, Jeff	Victoria
Hawkins, James M.	Eagle Bay
Hawley, Bryan	Port Coquitlam
Hayes, William	Old Remo
Hayley, D.K., RPF	Victoria
Hayley, Leonard, B.Sc.	Coquitlam
Hayward, John L.	Vernon
Heald, Crystal	Vancouver
Hebert, D., Ph.D.	Williams Lake
Hebert, Suzanne	Vancouver
Heiltsuk Tribal Council	Waglisla
Helfrich, R.L., RPF	Kamloops
Hemphill, Colleen	Port Alberni
Henderson, C.R.	New Hazelton
Henderson, W.R.	Gibsons
Hendry, E.J.	Manson Creek
Hennigan, Mike	Queen Charlotte City
Herbert, D.	Williams Lake
Heriot, J.E.	Vernon
Heritage Forests Society	Vancouver
Hess, Peter	Bella Coola
Heuston, Linda	Creston
Hickling, Earl Grey Wolf	Nelson
High Country Tourism Association	Kamloops
Hilke, Edwin E.	Grand Forks
Hill, Anthony J.	Nelson
Hilton, Jim	Williams Lake
Hind-Smith, John	Gibsons
Hinre, Bruce	Erickson
Hirkala, Deborah	Nelson
Hitzroth, Alan J., P.Eng.	Kimberley
Hoadley, Robert G.	Port Alberni
Hodge, Lloyd	Cranbrook
Hodgkinson, Robert, RPF, RP.Bio	Prince George
Hollick-Kenyon, Tim	Big Creek
Holmes, S.R.	Port Alberni

Holmes, Tom	Port McNeill
Holt, Michael F.	Sidney
Hope & District Chamber of Commerce	Hope
Hopkins, Jon A.	Pemberton
Hoover, Jean	Creston
Hoover, Roy	Castlegar
Hopwood, Allen, RPF	Brentwood Bay
Hopwood, Doug	Lasqueti Island
Horel, Colin	Revelstoke
Horne, David A., RPF	Dawson Creek
Hornick, Peter D., A.Sc.T.	Armstrong
Hornidge, Bruce E.	Ucluelet
Houlden, Robert	Hope
Houlden, Trevor	Kimberley
Hourston, B.	Nanaimo
Houston Economic Development Committee	Houston
Houston Forest Products Co.	Houston
Howard, A.J.	Wasa
Howard, Roy	Dunster
Howes, Ian T.	Kamloops
Hudson, D.	Salmon Arm
Huffman, Margaret	Prince George
Huebert, Ewald W.	Golden
Hughes, E.M.	Qualicum Beach
Huk, Walter	Cecil Lake
Hulland, Susan	Crawford Bay
Humphries, Amelia	Lasqueti Island
Humphries, Michael	Lasqueti Island
Huneck, Lavonne	Cobble Hill
Hunniford, Sharon	Aldergrove
Hunter, R.J.	Kamloops
Huppler-Poliak family	Chase
Huscroft, Roger	Lister
Huscroft, Ruth	Erickson
Hutton, Dr. R.L. and Paula	Nelson
IWA-Canada/Canadian Paperworkers' Union/ The Pulp, Paper & Woodworkers of Canada	Vancouver
IWA-Canada, Local 1-71	Sandspit
IWA Forest Environment Committee	Port Hardy
Independent Loggers of the Revelstoke Wet Belt	Revelstoke
Independent Timber Marketing Association	New Westminster
Industrial Forestry Service Ltd.	Prince George
Informed Cherryville Area Residents for the Environment (ICare)	Cherryville
Ingram, Gordon B., Ph.D. and Audrey Pearson	Vancouver
Inland Kenworth/Parker Pacific	Quesnel
Inman, Sandra	Cranbrook
Institute for Research on Public Policy	Victoria
Interior Loggers' Association	Savona
Interior Lumber Manufacturers' Association	Kelowna
Interior Woodlot Operators' Association	Savona
International Forest Products Ltd.	Vancouver
International Wildlife Protection Association	Kamloops
Intertribal Forestry Association of British Columbia	Kelowna
Gordon A. Irwin Logging	Whaletown
Islands Protection Society	Masset
Islands Trust Forest and Land Use Committee	Victoria
Jablanczy, Dr. A.	Vancouver
Jackson, Adeline	Edgewood
Jackson, Thomas P., C.G.A.	Cranbrook
Jacobs, Mike	New Hazelton
Jacobson Bros. Forest Products Ltd.	Williams Lake
Janyk, Barry J.	Sechelt
Jarvis, P.M.	Port McNeill
Jarvis, Ronald E.	Nanaimo
Jay, Sonny, RPF	Terrace
Jeanes, Charles H.	Nelson
Jeffrey, Margaret and Alan	Winfield
Jenkins, Tony	Revelstoke
Jensen, Hans and Jessie	Skookumchuck
Jensen, H.R.	Duncan
Jensen, S.	Abbotsford
Jensen, Tove	Salmon Arm
Jewell, Glen	Salmon Arm
Jewell, Ross W.	Terrace
Joelimand, J.	Salmon Arm
Johanson, F.E., B.Sc., M.C.I.C.	Vancouver
Johnson, Frances	Comox
Johnson, Gary/Gary Johnson Logging Ltd.	Cranbrook
Johnson, Gordon P.	Prince George

Johnson, Mary Lou	Vernon
Johnson, Mike	Nanaimo
Johnson, Robert A.	Salmon Arm
Johnson, R.H.	Creston
Johnston, Lloyd	Salmon Arm
Johnston, Peter	Lasqueti Island
Johnston, Thomas A.	Ashcroft
Johnston, T.R., RPF	Nelson
Johnstone, Ian R.	Gabriola Island
Jones, Ron	Summerland
Jones, Trevor	Vancouver
Judge, Loralee	Kamloops
Junction Machinery & Supply Ltd./L.B. Uri	Creston
Jung, Stanley	Vancouver
Kagawa, Patti, RPF	Victoria
Kahl, C.	Skookumchuck
Kaiser, Peter and Myrna	Erickson
Kalamalka Junior Secondary School Environment Club	Kalamalka
Kalichuk, George	Chetwynd
Kamloops Fish and Game Association	Kamloops
Kamloops High School	Kamloops
Kamloops Naturalist Club	Kamloops
Kanemitsu, Harue	Fauquier
Kangi, F.	Edmonton
Kania, Stan	Telkwa
Kapitany, J.Z., RPF	Woss
Kaslo Community Forest Enhancement Society	Kaslo
Kaslo Community Resources Committee	Kaslo
Kasting, Norman W., Ph.D.	Vancouver
Keays, Patricia	Powell River
Keery, John	Kelowna
Kelfe Bros. Auto Ltd.	Abbotsford
Kellas, Peter	Qualicum Beach
Keller, Emily	Surge Narrows
Keller, Lannie	Surge Narrows
Kellerhals, Heather and Rolf	Heriot Bay
Kelly, B.A.	Campbell River
Kelly, Shortie	Prince George
Kennes, W.	Delta
Kerr, Shirley	Port McNeill
Kershaw, Jack	Cranbrook
Kettle River Stockmen's Association	Rock Creek
Kilb, Rowena	Argenta
Kimberley Wildlife & Wilderness Club	Kimberley
Kimmur Forestry Consultants Ltd.	Cranbrook
King, D.	Vancouver
King, Margaret	Vancouver
Kingshorn, R.H., P.Eng.	New Westminster
Kinley, Trevor	Wardner
Kipp, Robert A.	Cranbrook
Kirby, Sandra	Port McNeill
Klinkhamer, Richard M.	Powell River
Kluskus Indian Band	Quesnel
Knight, Hal, B.S.A., M.Sc.F., Ph.D.	Victoria
Knight, Helen and Trevor Goward	Clearwater
Knopp, Lee and Denis	Sardis
Kock, Sig A.	Quesnel
Koerner, Walter C., F.R.S.C.	Vancouver
Kohnert, Otto and Elli	Barriere
Kolchingnes, Don	Salmon Arm
Komori, Julie, RPF	Nelson
Kondor, George, RPF	Prince George
Konishi, Jrizi, RPF	Brentwood Bay
Konkin, J. and L.C. Lodge, RPFs	Cranbrook
Kootenay Indian Area Council ("Ktunaxa/ Ksanka")	Cranbrook area
Kootenay Livestock Association	Cranbrook
Kootenay Lake Chamber of Commerce	Gray Creek
Kootenay Lake Eastshore Forest Council	Crawford Bay
Kootenay Lake Woodlot Association	Argenta
Kopas, Leslie	Vancouver
Kopernick, Marilyn and Tim	Cranbrook
Korelus, V., RPF	Victoria
Kosick, Dick, RPF	Qualicum
Kraft, Ben	Sicamous
Kremsater, Laurie L.	Mount Lehman
Krentz, Richard A.	Merville
Kusler, E.N.	Penticton
Kwakiutl District Council	Port Hardy
Kyle, Rob, RPF	New Westminster
Kyuquot Economic Environmental Protection Society (KEEPS)	Kyuquot
Lac La Hache Livestock Association	Lac La Hache
Lacko, Janice	Enderby
Lague, Christian	Cranbrook
Laing & McCulloch	Smithers

Lake Babine Band	Burns Lake
Lakeland Mills Ltd.	Prince George
Lakes District Friends of the Environment	Takysie Lake
Lakes District Independent Loggers' Association	Burns Lake
Lamb family	Lasqueti Island
Lamont, Tom and Kim	Ladysmith
Lamoureux, Gregoire	Winlaw
Landon, Dave	Port Hardy
Landscape Architecture Program - University of British Columbia	Vancouver
Landscope Consulting Corporation/ Trevor Chandler	Lillooet
Lang, Jo-Anne	Prince George
Lang, Stuart	Cranbrook
Langton, John F.	Vernon
Langworth Community Association (Friends of the Bearpaw Ridge)	Sinclair
Lapierre, Thomas	North Vancouver
LaPointe, Brian, RPF	Williams Lake
Latchko, J. Herbert	Enderby
Latoszek, J.S.	Edmonton
Latter, Walter and Carol	Duncan
Laux, William A.	Fauquier
Lavender, Denis P., Professor	Vancouver
Laverdure, Leslie N.	Horsefly
LaVigne, Willy	Vancouver
Lawson, Mike	Houston
Lawson, Paul	Burnaby
Lax, Noel	Quadra Island
Lea, Lora and Edward	Victoria
LeBlanc, Paul and others	Cranbrook
Lee, Gregor	Powell River
Lee, Lisa	Cobble Hill
Leesing, John, RPF	Coquitlam
Leeson, Michael J.	Nanaimo
Lehmann, Wady	Surrey
Leitch, Jeanette	Vancouver
Lepetick, Mark	Quesnel
Lepine, Louis	Port Hardy
Ted LeRoy Trucking Limited	Duncan
Leslie, W.	Salmon Arm
Letnick, Linda	North Delta
Lewis, Dan	Vancouver
Lewis, Terence, B.S.F., Ph.D.	Burnaby
Lewis, Tom	Kamloops
Lewis, Trevor	Sidney
Lier, Lisa	100 Mile House
Likely & District Senior Citizens Association	Likely
Light, Peter	Sechelt
Lightburn, Fred	Jaffray
Lighter, David	Marysville
Lightman, Samuel M.	Fulford Harbour
Linde, Kenneth and Kathey	Williams Lake
Linnaea School	Manson's Landing
Lionsgaters Four Wheel Drive Society	North Vancouver
Lipsett, Jeff	Salmon Arm
Lloyd, David	Mission
Lloyd, Howard	Prince George
Littler, Chris	Ganges
Loberg, Evertt	Chetwynd
Lockard, S.M., RPF	Victoria
Lodge, Craig and John Konkin, RPFs	Cranbrook
Loftus, Jim	Campbell River
Logan, Brian, John Casteel, Cecil Gray, RPFs	Prince George
Logan Lake Tourism/Marketing/ Promotion Committee	Logan Lake
Long, Ronald G.	Port Moody
Longworth Community Association	Sinclair Mills
Loomis, Ruth	Gabriola Island
L'Oran, Joe	Smithers
Loring, Tom	Victoria
Lotzkar, Joe	Vancouver
Lowenberger, F., RPF	Vancouver
Lowrey, Terry	Crescent Beach
Lowrey, Ursula	Crescent Beach
Luke, Bill	Cranbrook
Lumby Range and Livestock Association	Lumby
Lumsdon, V.J.	Port Alice
Lund, Robert	Revelstoke
Lundgren, Thomas, RPF	Vancouver
Lusk, Sheryl C.	Delta
Lyotier, Barb	Houston
Lytton Lumber Ltd.	Lytton
MacDougall, Gerry	Chase
MacIntosh, Josephine	Victoria

Mackenzie Chamber of Commerce	Mackenzie
Mackenzie-McLeod Lake Trappers Association	Mackenzie
MacLennan, Warren	Clearwater
MacLeod, G.	Houston
MacMillan Bloedel Limited	Vancouver
MacNeill, Grant and Wanda Sawatsky	Cranbrook
Macpherson, Malcolm, B.Sc., M.I.C.For.	Oban, Scotland
MacPherson, M.A.	Salmon Arm
MacWatt, Andrew M.	Cranbrook
McAllister, Pat Swift	Victoria
McArthur, H.R.	Nelson
McBride, Arthur/Northern Welding Ltd.	Fort Nelson
McBurney, Jim	Victoria
McCarthy, C.F.	Salmon Arm
McCloskey, Kelly	100 Mile House
McCulloch, Larry D., B.Sc.F., RPF	Smithers
McClure, Donald R.	Vancouver
McDonagh, C.M.	Victoria
McDonald, R.	Delta
McEwan, Allan	Pemberton
McGee, Gayle	Nanoose Bay
McGhee, W.P.T. (Bill), RPF	Coquitlam
McGinn, Eric	Vancouver
McGregor, Gary, LL.B.	Richmond
McGregor Wilderness Society	Prince George
McIntosh, W.D.	Vanderhoof
McIntyre, Gladys Jane	Argenta
McIver, Ian	Franklin River
McKee, Kenyon	Nelson
McKirdy, Ann	Valemount
McLaughlin, Joe	Cranbrook
S.N. McLean Forestry Services Ltd.	Kamloops
F.D. McLearon Ltd.	North Vancouver
McLeod Lake Indian Band	McLeod Lake
F.D. McLearon Ltd.	North Vancouver
McMahon, K. and M.	Port McNeill
McMaster, J.R. (Dick)	Kamloops
McMillan, R.D.	Surrey
McMorran, Bruce	Simoom Sound
McMullan, D.L., RPF	Royston
McNabb, E.L.	Chilliwack
McWilliams, Paul	Prince Rupert
M.B.M. Contracting Ltd.	Cranbrook
Madsen, Don	Ganges
Maguson, Heather	Vernon
Maltby, Francis L.	Revelstoke
Manson, William V.	Squamish
Maple Ridge Secondary School students	Maple Ridge
Mara/Shuswap Property Owners Society	Salmon Arm
Marchant, David	McBride
MarDan Enterprises Ltd.	Armstrong
Marra, Jack	Creston
Marriner, Ray	Creston
Marshall, Bill	Port Moody
Marshall, Fred, RPF	Midway
Martin, B.M.	Sidney
Martin, Cris	Bralorne
Martin, Jim	Ucluelet
Martin Prairie Livestock Association	Kamloops
Masmussen, W.	Vancouver
Massey, Douglas G.	Delta
Masters, Ruth J.	Courtenay
Masuch, Elvin	Creston
Mather, W.	Nakusp
Matthews, Ken, RPF	Port Alberni
Mathews, Robert and family	Chase
Mawdsley, Steve	Cortes Island
Maxwell, David and Andree	Salmon Arm
Meadow Valley Stock Association	Penticton
Meager Creek Wilderness Society	Vancouver
Meaker Log & Timber Co.	Port McNeill
Meehan, D.J., RPF	Clearwater
Meiorin, Tawney/Kootenays Preserving the World Foundation	Rossland
Melenka, D.W.	Cranbrook
Menzies, Joyce	Victoria
Meredith,Roderick B.	Terrace
Metchosin Association for Conservation of Environment (MACE)	Victoria
Michalky, Herbert	Creston
Middelburg, Bert, RPF	Kamloops
Mierau, Rosa	Salmon Arm
A.R. Milavsky and Associates	New Westminster
Milkun, R.	Surrey
Miller, Dan, MLA - Prince Rupert	Prince Rupert
Miller, Dan & Associates	Creston

Miller, Don R.	Kimberley
Milner, L.J.,RPF	Nanaimo
Mills, Alan	Canoe
Mills, Barry E., RPF	Prince George
Mills, L.	Cranbrook
Mindek, Jack L.	Elko
Mining Association of British Columbia	Vancouver
Misutka, Douglas S., RPF	Kelowna
Mitchell, Allen	Sicamous
Mitchell, Andrew S., RPF	Sidney
Mitchell, Barbara	Vernon
Mitchell, Bill and Bobbi/ Tunkwa Lake Resort and John Wegrich	Logan Lake
Mitchell, Colleen	Edmonton
Mitchell, Fred O.	Armstrong
Mitchell, Robert and Joanne J. Leesing, RPFs	Golden
Mitlenatch Field Naturalists Society	Quadra Island
Monashee Outfitting/Volker Scherm	Revelstoke
Monchak, Darcy, RPF	Golden
Monetta, Anna, RPF	Prince George
Monteith, R.W.	Wasa
Moon, M.	Armstrong
Moore, Bill	Castlegar
W.D. Moore Logging Co. Ltd.	Winter Habour
Moore, Keith	Queen Charlotte City
Moorman, Albert E., Ph.D.	Sorrento
Moorman, Evelyn B.	Sorrento
Moose Valley Outfitters/ Ron Steffey	Germansen Landing
Moresby Consulting Ltd./ Patrick Armstrong	North Vancouver
Morgan, Ray	Kitwanga
Morrison, N.W., RPF	Cranbrook
Mortimer, Don	Rossland
Moses, Samuel	Gibsons
Motherwell, Andy	Quesnel
Moul, Ian E., B.Sc. (Ag)	Lantzville
Mountjoy, Keith and Colleen	Victoria
Muehlenberg, Bernd A., M.D.	Port Alberni
Mullen, Michael	Port Alberni
Mulock, E.N., RPF	Woss
Munkholm, Dallas M.	Creston
Munro, Keith	Golden
Munson, Joan C.	Terrace
Murphy, Don L.	Aldergrove
Murray, Art	Eagle Bay
Murray, John R.S.	Nelson
Mussell, Jay	Lillooet
Myers, Leslie	Cranbrook
Nakusp and District Water Commission	Nakusp
Nanaimo Field Naturalists	Nanaimo
Naramata Citizens Associations	Naramata
Nature Hills Resort/Gianni and Magi Bianchi	Lone Butte
Nature Trust of British Columbia	West Vancouver
Nechako Environmental Coalition	Prince George
Nechako Valley Regional Cattlemen's Association	Vanderhoof
Necoslie (Nak'azdli) Indian Band	Stuart Lake
Neftin, Richard	Hagensborg
Nelson, Erin	Vernon
Nelson, JoAnne L.	Victoria
Nelson, John, RPF, Professor	Vancouver
Nelson, Nels	Vancouver
Nemi, Jean	Vancouver
Nevalainen, Ellen	150 Mile House
New, Chris	Cranbrook
New, Michael	Burnaby
Nicholson, A.C.	Victoria
Nickell, Kathy	Cranbrook
Nicolay, Larry	Port Moody
Nielsen, Hakon, RPF	Rock Creek
Nightingale, Larry	Parson
Nisga'a Tribal Council	New Aiyansh
Niut Wilderness Society	Tatlayoko Lake
Nolan, Eric	Port McNeill
Norie, Susan and Jack	Port Coquitlam
Norn, Dan	Powell River
Norris, D.J., RPF	Nelson
North by Northwest Tourism Association	Smithers
North Coast Woodlot Association	Terrace
North Columbia Group of the Sierra Club of Western Canada	Kelowna
North Island Citizens for Shared Resources	Port Hardy
North Island Woodlot Association	Merville
North Okanagan Forest Watch Committee	Vernon
North Okanagan Livestock Association	Vernon

North Okanagan Naturalists' Club	Vernon
North Shuswap Women's Institute	Chase
Northern British Columbia Steelhead Guides Association	Telkwa
Northern Forestry Concern Coalition	Chetwynd
Northwest Guides & Outfitters Association	Smithers
Northwood Pulp and Timber Limited	Prince George
Nowell, David and Class of Geography 375, 1990, University of Victoria	Victoria
Nuu-Chah-Nulth Tribal Council	Port Alberni
108 Mile Elementary School - Sonja Schenkweld, Amber Broadworth and Lisa Lier	100 Mile House
Oborne, Neil	Bella Coola
Oikawa, Mitsuo	Port McNeill
The Okanagan Greens	Penticton
Okanagan Similkameen Parks Society	Summerland
Olson, Stanley M.	Clearbrook
Omelus, A.	Nanaimo
O'Connor, M.J.	Port McNeill
O'Neill, Kevin F.	Bella Coola
O'Neill, Phyllis	Denman Island
O'Neill, Rick	Burnaby
Ondrik, R.J.	Cranbrook
Openshaw, Tim/Syncra Wood Products Ltd.	McBride
Orenda Forest Products	Stewart
Ortega, Rich and Carol-Ann	Kaslo
Osborn, Steve, RPF	North Vancouver
Osenenko, Rick	Kyuquot
Oseychuk, Jim	Golden
Osler, Debbie	Gibsons
Osmers, Karl	Bella Coola
Oswald, David L.	Nelson
Otava, John D., RPF	Coquitlam
Outdoor Recreation Council of British Columbia	Vancouver
Owen, Scott and June	Ta Ta Creek
Owen, Trevor J.	Kamloops
Oweekeno-Kitasoo-Nuxalk Tribal Council	Port Hardy
Ozanne, Ron	Castlegar
Pachal, Lynn	Cranbrook
Pacific Regeneration Technologies	Victoria
Paddison, Thomas	Sorrento
Paish, Howard	Coquitlam
Paisley, Ken	Tahsis
Palmer, Richard	Victoria
Panton, Donald	Burnaby
Parker, Margaret and Marilyn Huggans/ Selkirk College Forestry Committee	Kaslo
M.L. Parker Company Inc./M.L. Parker	Vancouver
Pascuzzo, Mike, RPF	Erickson
Pasieka, Marilyn R.	Nakusp
Patterson, Bernice	Cranbrook
Patterson, Ross	Kimberley
Pauls, Patricia J.	Kelowna
Payne, A.J.	Fort St. John
Payne, Garry E.	Port Moody
Peace River Branch of the B.C. Institute of Agrologists	Dawson Creek
Peace River Woodlot Association	Fort St. John
Pearce, Cindy, RPF	Vancouver
Pearson, W.S., RPF	Port McNeill
Peebles, John, RPF	Williams Lake
Pelter, J.A.	Victoria
Pemberton, Clive	Ucluelet
Pendergast, Lawrence	Lac La Hache
Penson, James E.	Wasa
Percy Logging Co. Ltd.	Vancouver
Pereboom, Dirk, RPF	Vernon
Perry, Jane L., RPF	Williams Lake
Peterson, Gladys	Gibsons
Peterson, Rodger L.	McBride
Petrik, Phillip J.	North Vancouver
Phaneuf, Robert L., RPF	100 Mile House
Pharand, Donald	Castlegar
Phillippe, Mr. and Mrs. J.	Pitt Meadows
Phillips, Joan M.	Chase
Phoenix Society	Galiano Island
Pichugin, John, RPF	Pitt Meadows
Pielou, E.C., Ph.D., D.Sc.	Denman Island
Pimainus Fishing Camp	Surrey
Pine, Jim	Victoria
Planning Committee for Earth Day in the West Kootenays/Nancie and Kirkland Shave	Nelson
Planning Institute of British Columbia	Nelson
Plecash, L.	Kamloops
Pleva, John	Kamloops

Pole, Graeme	Field
Pollack, Rob	Tlell
Pollard, Allen, RPF	Golden
Polster Environmental Services	Duncan
Pommier, Greg and Jeanette	Skookumchuck
Pommier, J. David	Wasa
Pope & Talbot Ltd.	Grand Forks
Pope, Richard	Shawnigan Lake
Popp, Michael	McBride
Porpaczy, L.J.	Victoria
Port McNeill and District Chamber of Commerce	Port McNeill
Porter, Arnold, M.Ed.	Victoria
Porter, David M.	Victoria
Porter, Norm	Williams Lake
Potter, Steve, RPF	Mackenzie
Porteous, Lorne	Salmon Arm
Povey, Janice M.	Ucluelet
Pratt, John	Victoria
Prescott, J. Gordon	Lion's Bay
Price, Angela	Rossland
Price, C.	Kamloops
Priest, Alan S.	Burns Lake
Primeau, Sharon	Alexis Creek
Prince George Cattlemen's Association	Prince George
Prince George Earth Day Committee	Prince George
Prince George TSA Committee	Prince George
Prince George Wood Preserving Ltd.	Prince George
Prince George Woodlot Association	Prince George
Prince, Ray	Prince George
Pringle, William L., P.Ag.	Salmon Arm
Prins, E.	Houston
Pritchard, Jon, P.Eng.	Cranbrook
Professional Mushroom Pickers of the World	Hagensborg
Pro Terra Kootenay Nature Allies	Argenta
Project North, B.C.	Vancouver
Prueter, M.G. (Mike)	Burnaby
Przeczek, John, RPF	Cranbrook
Ptarmigan Tours/Margory Jamieson	Cranbrook
Puhky, Ron, M.D.	Fulford Harbour
Pulp, Paper and Woodworkers of Canada, Local 10	Kamloops
Pulp and Paper Research Institute of Canada	Vancouver
Purdy, Curtis	Kimberley
Purssell, Norman	West Vancouver
Quadra Island Forest Resources Committee	Quadra Island
Quennell, Kathy	Cranbrook
Quesnel Cattlemen's Association	Quesnel
Quesnel Forestry/Economic Development Advisory Committee	Quesnel
Quest Contracting Ltd.	Vernon
Quirk, Tom	Cranbrook
R.J.A. Forestry Ltd./R.J. Arnold RPF	Terrace
Ramoay, B.	Montrose
Rasang, Ms. S.	Terrace
Ranshaw, Bob and Tracey	Courtenay
Raybold, Tim	Kelowna
Raymond, Bev and others	Cranbrook
Recreational Canoeing Association	Vancouver
Red Mountain Residents Association	New Denver
Redl, Thomas E.	150 Mile House
Redman, Brian	Richmond
Reed, F.L.C., Professor	Vancouver
Reed, Gary and Doreen/Chute Lake Resort	Naramata
Reekie, Frances L.	Cranbrook
Regan, Martin/Dent Island Lodge	Big Bay
Regier, Doug, RPF	Chilliwack
Regional District of Alberni-Clayoquot	Port Alberni
Regional District of Bulkley Nechako	Burns Lake
Regional District of Central Kootenay	Nelson
Regional District of Fort Nelson-Liard	Fort Nelson
Regional District of Fraser-Cheam	Chilliwack
Regional District of Kitimat-Stikine	Terrace
Regional District of Mount Waddington	Port McNeill
Regional District of Peace River	Tumbler Ridge
Regional District of Thompson-Nicola	Kamloops
Reid, Madeline	Victoria
Reimer, Rod	Dunster
Reitsma, Jack	Smithers
Revel, John	Prince George
Revelstoke Chamber of Commerce	Revelstoke
Revelstoke Environmental Action Committee	Revelstoke
Rhymer, James	Hudson's Hope
Richardson, R.E.	Burnaby

Ridgway, Arthur	Lindell Beach
Ringwald, Ursula and Ellen Lundh	Kaslo
Rison, Stephen W.	Dawson Creek
Riverside Forest Products	Lumby
Roberts, Richard	Calgary
Robertson, Kenneth W.	Williams Lake
Robertson, Rosalind	Kelowna
Robilliard, A.	Port McNeill
Robinson, Brian, RPF	Prince George
Robinson, Jack, RPF retired	Kamloops
Robinson, Tony, RPF	Kamloops
Robbins, Pamela	Halfmoon Bay
Rockwell, J. Laurie	Summerland
Roddy, D.W.	Merritt
Rollerson, T., P.Ag. and E. Steele	Gabriola Island
Ron Waldron Contracting Ltd.	McBride
Rosk, Carl	Williams Lake
Ross, Paul	Telkwa
Ross, Robert C., RPF	Terrace
Rossland Advisory Committee on the Environment	Rossland
Roth, Bjorn	Prince George
Rothwell, R.L., Professor	Edmonton
Rotherham, A.A.,RPF	Montreal West
Rounsville, Dennis E., RPF and Nella Rounsville	Parson
Rouse, M.J.	Cranbrook
Rowland, G.	Vernon
Ruljancich, Frank and Libby	Castlegar
Rumsby, L.	Victoria
Rushton, Brad, A.S.C.T.	Port Alberni
Russow, Joan	Victoria
Rustad Bros. & Co. Ltd.	Prince George
Rustad, Lawrence	Prince George
Ryan, Debbi	Port McNeill
H.J. Saaltink & Associates	Mt. Lehman
Sanders, Peter R., RPF	Maple Ridge
Sahlin, Craig	Kelowna
Salie, A.	Sidney
Salle, Ed	Barriere
Salley, Tom	Williams Lake
Salmon Arm & District Chamber of Commerce	Salmon Arm
Salmon, Brett	Golden
Sanborn, Paul	Vancouver
Sandeman, Barry	Erickson
Sanders, Peter R.W., RPF	Maple Ridge
Sather, Hans	Cranbrook
Savage, Jeff	Delta
Scana Industries Ltd.	Prince George
Schaerer, Peter	North Vancouver
Schat, Mack	Smithers
Schell, K.W.	Cranbrook
Schenkweld, Sonja	100 Mile House
Schindler, Sailan	Johnson's Landing
Schmidt, Bertha	Victoria
Scholefield, Dorothy	Vancouver
Scholz, Hans, RPF	Fort St.John
School District No. 56 (Nechako)/Sergio Petrucci	Vanderhoof
Schultz, Howard	Edmonton
Schutter, Bob	Gray Creek
Schweitzer, Pamela	Merville
Schwertner, Rudi, P.Eng.	Surrey
Scott, Corinne and John Christian	Endako
Scott, Russell	Canoe
Scott, Sylvia and others	Victoria
Scott Paper Limited	New Westminster
Seastrom, William and Lydia	Cedar
Seigo, Arnold	Kelowna
Seinen, Albert	Houston
Seinen, Henry	Houston
Shank, Douglas	Westbank
Shannon, E.M.	Courtenay
Share Our Forests	Cobble Hill
Share our Resources Society	Port Alberni
Share the Clayoquot	Ucluelet
Share the Stein Committee	Boston Bar
Shave, Rob	Victoria
Shaw, Barry/Bear Creek Ranch	Chase
Shelton, James	Hagensborg
Sherwood, Bob and colleagues	North Vancouver
Shipway, David	Campbell River
Shook, Ed	Vavenby
Shorter, Bruce	Cranbrook
Shortreid, A.F., RPF	Mill Bay
Shuswap Forest Liaison Committee	Salmon Arm
Shuswap Naturalists	Salmon Arm

Sierra Club of Western Canada	Victoria
Sierra Club of Western Canada - Lower Mainland Group	Vancouver
Silberberger, Jacob	Vanderhoof
Silvatech Consulting Ltd.	Salmon Arm
Silvhorn Forest Tending Ltd.	Hornby Island
Simpson, Mr. and Mrs. David	Charlie Lake
Single Tree Holdings Ltd.	Williams Lake
Skeena Cellulose Inc. and Repap Enterprises Inc.	Vancouver
Skeena Round Table for Sustainable Development	Smithers
Skene, Ron	100 Mile House
Skippon, Mr. and Mrs. Allan	Gibsons
Sky, Kreg	Alexis Creek
Slack, Mary Anne	Parksville
Slaco, Richard, RPF	Campbell River
Slater, Rick	Atlin
Slocan Forest Products Ltd.	Richmond
Slocan Forest Products Ltd. - Quesnel Division	Quesnel
Slocan Forest Products Ltd. - Radium Division	Radium Hot Springs
Slocan Forest Products Ltd. - Slocan Division	Slocan
Slocan Forest Products Ltd. - Valemount Division	Valemount
Slocan Valley Watershed Alliance	Winlaw
Small Operators of Houston	Houston
Smeele, Frank J.	Fort St. James
Smialowski, M., M.D.	Smithers
D.W. Smith (1984) Ltd.	Victoria
Smith, Fred W.A.	Kelowna
Smith, J. Harry G., Professor	Vancouver
Smith Heintz, J. Hanne, R.P.Bio.	Rossland
Smith, James H.	Vernon
Smith, John	Salmon Arm
Smith, Leonard C.	Hudson's Hope
Smith, Rick, RPF	Vernon
Smith, W.H.	Houston
Smithers Exploration Group	Smithers
Smithson, Kenneth and Karen	Vancouver
Smoody Logging/Jeff and Kate Smoody	Kelowna
Society for Range Management, Pacific Northwest Section, B.C. Chapter	Nelson
Soehngen, Ulf	Victoria
Soltice, Richard P.	Rossland
Sommer, Karl	Tappen
Sommer, Richard B, RPF	Chase
Sonnenberg, Harry and Dorothy	Magna Bay
Sorensen Contracting	Revelstoke
Sorsey, Terry	Anahim Lake
South Cariboo Trappers' Association	Forest Grove
South East Kelowna Irrigation District	East Kelowna
South Island Woodlot Assoc/ D.A. Smith, RPF	Nanaimo
Southern Chilcotin Mountains Wilderness Society	Gold Bridge
Southern Interior Category 2 Wood Processors Association	Penticton
Sparks, Betty Lou	Port McNeill
Sparks, Ron	Port McNeill
Spence, Ella and Richard	Edgewood
Spence, Margot	Victoria
Spencer, G.A.	Vancouver
Spicer, C.	Nakusp
Squamish and Howe Sound Chamber of Commerce	Squamish
Stahnke, Michael	Harrogate
Stanyer, Roger	Duncan
Star, Day	Winlaw
State of the Islands	Nanaimo
Stathers, Robert J., M.Sc., P.Ag.	Penticton
Stearns, Sharon	Chase
Steelhead Society of B.C.- Prince George Chapter	Prince George
Steering Committee Community Forest	Duncan
Steffey Ron/Moose Valley Outfitters	Germansen Ldg.
Steffl, Michael	Vernon
Stege Logging Limited	New Hazelton
Stein, Darren	Victoria
Stephen, J.M., RPF	North Vancouver
Stephens, Dale	McBride
Stephens, Elaine	Port McNeill
Stevely, R.	Cranbrook
Stevens, Ron	Canoe
Steward, Joy	Revelstoke
Stewart, Duncan M., P.Eng.	West Vancouver
Stewart, Rob	Dean River
Stewart, Shirley	Tappen
Still, Gerry, RPF, David Spittlehouse and seven others	Sidney

Stonehouse, John and students of English Programs at Camosun College	Victoria
Straight, Lee	Vancouver
Stramanus, Karl	Port Hardy
Strang, R.M., Ph.D., RPF	Burnaby
Stratton, Robert	Sandspit
Street, Jathra	Vernon
Strimbold, E.A.	Burns Lake
Strong, Janice	Cranbrook
Strong, Michael	Cranbrook
Strucel, Irene, RPF	Nelson
Stuart Nechako Woodlot Association	Vanderhoof
Students Acting for Global Awareness	Maple Ridge
Sunshine Coast Regional District Economic Development Commission	Sechelt
Sunshine Logging Ltd.	Kaslo
Surge Narrows Community Association	Surge Narrows
Suskwa Community Association	North Hazelton
Sutton, Charles E.	Cranbrook
Sweder, Norman	Prince George
Sweeny, S.B.I.	Cortes Island
Swenson, Barry	Canoe
Sybert, Warren, P.Eng.	Sechelt
Syncra Wood Products Ltd./ Tim Openshaw	McBride
Szalkai, Andy, RPF	Quesnel
Tabak, John	Vancouver
Tackama Forest Products Ltd.	Fort Nelson
Tanizul Timber Ltd. and Tl'azten Nation Council	Fort St. James
Tanz, Jordan S., M.F., RPF	Vancouver
Taylor, Danny	Shawnigan Lake
Taylor, Stephen W., RPF	Victoria
Teather, Susan and Robert	Delta
Ted Leroy Trucking Ltd.	Duncan
Telling, Gwen	Erickson
Terminal Forest Products Ltd.	Richmond
Terracana Ranch & Resort Ltd.	Valemount
Terrace Farmers Institute	Terrace
Tete Jaune Community Club	Valemount
Thomas, Judy, RPF	Fort St. John
Thomson, H.	Kamloops
Thomson, Robert Garth	Rossland
Thompson, Gary	Wynndel
Thompson, Patrick	Victoria
Thompson Watershed Coalition	Kamloops
Thomson, Mary L.	Johnson's Ldg.
Tifenbach, Denise	Vernon
Tkachuk, David	Lulu Island
Todd, A.M.D., RPF	Prince George
Todd, Gordon C., RPF	Gibsons
Tofino Sustainable Development Community	Tofino
Tolko Industries Ltd.	Vernon
Tolksdorff, Wendy	Mt. Lehman
Tolmie, William A.	Sardis
Tomkies, Richard	Vancouver
Toquaht Nation	Ucluelet
Torrie, R. Bruce	Vancouver
Town of Creston	Creston
Town of Port McNeill	Port McNeill
Townsend, D.	Vancouver
Trail and District Environmental Network	Trail
Travers, O.R., RPF	Victoria
Traverse, Brian	Parson
Treadstone Forestry Consultants Ltd.	Revelstoke
Trebett, D.	Port McNeill
Trenaman, Russ	Prince George
Tress, Joe W.	Sparwood
Trevett, J.T.	Nanaimo
Trew, D.M., RPF	Victoria
Triangle Contracting Ltd.	Dawson Creek
Tribe, J.	Cranbrook
Trip, Mr. and Mrs. C.	Penticton
Truck Loggers Association	Vancouver
Tsimshian Tribal Council ("People of Gila Quoex")	Prince Rupert
Tsuniah Lake Lodge/Brian Bulmer	Williams Lake
Tumbler Ridge Option 3 Committee/ Hermann Bruns	Tumbler Ridge
Tunkwa Lake Stock Breeders Association	Savona
Turner, Neil	Salmon Arm
Turtle Island Earth Stewards Society	Vancouver
Tuthy, Art and Kathy	Pemberton
Tweed, J.H.	Enderby
Tsawataineuk (Kingcome) Indian Band	Merville

Twin Island Resort Centre/ Sarah Kipp and Clive Callaway	Salmon Arm
Twitty, Eric	Nelson
Ucluelet Chamber of Commerce	Ucluelet
Uliana, D.	Queen Charlotte City
Ulkatcho Indian Band	Anahim Lake
University of British Columbia, Faculty of Forestry: 39 students of fourth year course in integrated resources management	Vancouver
Upper Louis Creek Stock Association	Heffley Creek
Upper North Thompson Livestock Association	Vavenby
Urbanski, Jeff	Nelson
Ursel, G.R.	Surrey
Ussner, Marianna	Vancouver
Uttke, Ray/Richland Sawmill	Lumby
Utzig, Gregory F., P.Ag.	Nelson
Valhalla Society	New Denver
Van Beynum, Ger H., R.I.A.	Vernon
Van Bergeyk, W.A.	Salmon Arm
Van Drimmelen, Ben	Victoria
Van Heek, W.H., RPF	West Vancouver
Van Mol, P.F., RPF	Kamloops
Van Oldenborgh	New Westminster
Vancouver Natural History Society	Vancouver
Vanden Hoek, Onno	Houston
VanderEnde, John, RPF	Houston
Vant, Neil, MLA - Cariboo	Williams Lake
Varabioff, Arleah	Vernon
Varney, Dick and Nancy	Lasqueti Island
Vernon Irrigation District	Vernon
Victoria Fish & Game Protective Association	Victoria
Victoria Golden Rods & Reels Society	Victoria
Victoria Sea Kayakers' Network	Victoria
Viklund, Marie	Erickson
Village Bay Lakes Park Committee	Quadra Island
Village of Clinton	Clinton
Village of Fort St. James	Fort St. James
Village of Hazelton	Hazelton
Village of Lake Cowichan	Lake Cowichan
Village of McBride	McBride
Village of Midway	Midway
Village of 100 Mile House	100 Mile House
Village of Sayward	Sayward
Village of Silverton	Silverton
Village of Tahsis	Tahsis
Village of Ucluelet	Ucluelet
Vogler, Stephen	Whistler
Von Westarp, G., RPF	Gabriola
Voth, Brian, RPF	Port Alice
Waelti, Hans, P.Eng., RPF	Brentwood Bay
Wagner, Barrie	Revelstoke
Wagner, Peggy	Sechelt
Wagner, William L.	Victoria
Waite, Ken, RPF	Lillooet
Wales, Sheral	Creston
Walker, Curtis	North Vancouver
Wallace, Lynn	Nanaimo
Wallace, M., RPF	Squamish
Walsh, Gerald	Salmon Arm
Walton, Bob and Pat	Ucluelet
Ward, Helen	Cranbrook
Ward, H.R., P.Eng.	Victoria
Wardwell, Will	Harrogate
Warner, Lawrence, RPF retired	Port Alberni
Warren, Royce	Vancouver
Wass, Tony	Victoria
Wasyk, Alex	Creston
Watling, Geoff	Hazelton
Watson, Ilene	Kelowna
Watson, Marilyn	Salmon Arm
Watson, R.M.	Cranbrook
Weatherbee, Neysa	Mount Robson
Weaver, Dave, RPF	Port Alberni
Weaver, Donald	Vanderhoof
Weaver, Ken, RPF	Grand Forks
Webb, G.W., P.Eng.	Cranbrook
Webber, Olive	Nanaimo
Weber, H.A.	Port Alice
Weir, Ian A.	Kaslo
Weeks, Jane	Valemount
Weetman, G.F., Professor	Vancouver
Weldwood of Canada Limited	Vancouver
Weldwood of Canada - 100 Mile House Division	100 Mile House
Weldwood of Canada - Quesnel Division	Quesnel

Wellburn, G.V., P.Eng., RPF	Vancouver
Wellburn, Jean	Williams Lake
Welch, Marilyn	Vancouver
Wells, John	Victoria
Welsh, W.J. (Bill)	Victoria
West Arm Watershed Alliance	Nelson
West Fraser Mills Ltd.	Quesnel
West Kootenay Forestry Alliance	Nelson
Westar Timber Limited	Vancouver
Westbank Indian Council	Kelowna
Westcoast Energy Inc/R.W. Falls, Ph.D.	Vancouver
Western Canada Wilderness Committee - Mid Island Branch	Nanaimo
Western Forest Products Limited	Vancouver
Western Silvicultural Contractors Association	Vancouver
Western Tree Seeds Ltd.	Blind Bay
Weyerhaeuser Canada Ltd.- British Columbia Division	Kamloops
Weyler, Rex	Manson's Ldg.
Wheeler, Sue	Lasqueti Island
Whissell, Jim	Fort St. James
Whitaker, Michael and Judy	Kelowna
White, George	Cranbrook
White, Steve	Vernon
Whitewater Kayaking Association of British Columbia	Vancouver
Whiting, Dr. J.E.	Summerland
Whitwell, Frank	Vernon
Wholistic Forestry Association	Vancouver
Wickland, Wendy and Grant	Fulford Harbour
Wight, Jim	Ganges
Wihlingson, Tony	Aldergrove
Wilderness Tourism Council	Vancouver
Wildlife Forestry Symposium	Prince George
Williams, J.D.	Fernie
Wilkinson, M.A.	Summerland
Williams, Lois	Port McNeill
Williams, Norm	Courtenay
Williams, Ron	Williams Lake
Williams, Vic	Burnaby
Williams Lake Field Naturalists	Williams Lake
Willis, Reg	Chetwynd
Willis, R.A., RPF	Vernon
Willow-Ahbau Forest Association	Prince George
Willson, Ed., Jr.	Bella Coola
Wilme, Frank	Kamloops
Wilmer, Frank, RPF	Kamloops
Wilson, Florence	Victoria
Wilson, Jim	Port McNeill
Wilson, Murray	Vernon
Wilson, R.S.	Wasa
Wilson, Sheila	Hagensborg
Winterford, Erskine	Saanichton
Wirtz, David	McBride
Wong, Tony, RPF	Burnaby
Wood, Paul M., RPF	Vancouver
Wood, Philip	Squirrel Cove
Wooding, Paul T.	North Vancouver
Woodland Consultants Ltd.	Campbell River
Woods, Jack H.,RPF	Duncan
Wright, Gerry	Vancouver
Wright, Harley	Barriere
Wright, Robert D.	South Slocan
Wright, Stephen	Victoria
Wright, Thomas, RPF	Vancouver
Wylie, N.	Prince George
Wynndel Box & Lumber Co. Ltd.	Wynndel
Wynndel Box & Lumber Co. Ltd./ Wynndel Logging Co. Ltd. - more than 20 employees	Wynndel
Yalakom Community Council	Lillooet
Yalakom Ecological Society	Lillooet
Yardley, Jonathan, MAIBC, MRAIC, RIBA	Ganges
Yeomans, Greg	Holberg
Young, D.W.	Lantzville
Young, Jeanette	Tumbler Ridge
Young, Victor M., RPF, P.Ag.	Coquitlam
Zakreski, Ron, B.A., P.G.D.,B.	Victoria
Zamara, Mike and Debbie	Cranbrook
Zammuto, Julie and family	Crescent Spur
Zanerick, Harry	Prince George
Zelesnik, Tom	Nakusp
Zens, Sandra	Port Alberni
Zimmer, Barbara N.	Prince George
Zimmerman, Nils	Burnaby
Zorn, George, RPF	Salmon Arm
Zuffa, William	Coquitlam
Zwickel, Fred C., Professor Emeritus	Manson's Landing

Appendix 11

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Appendix 12

GLOSSARY

ALLOWABLE ANNUAL CUT (AAC)
The volume of timber which may be cut each year from a forest management unit consistent with sustained yield.

BIOGEOCLIMATIC SYSTEM
In a biogeoclimatic system, climate is considered to be the principal environmental factor influencing ecosystem development.
In British Columbia a biogeoclimatic system is used as a framework for ecosystem classification.

BIOGEOCLIMATIC ZONE
Climatic variations within major climate belts produce significant ecological variation and the fairly homogeneous climatic sub-units are known as biogeoclimatic zones.

BIOLOGICAL DIVERSITY or BIODIVERSITY
The diversity of plants, animals and other living organisms and their habitats measured by factors such as genetic variability, number of species and variation in species composition.

CABLE YARDING
A term for any system in which loads of timber are lifted partly or wholly off the ground by means of steel cables or, more primitively, single fixed wires.

CLEARCUTTING
Complete removal of all trees from a given area at one time.

CLOSE UTILIZATION
A measure of the sound timber in a stand contained in all trees 9.1 inches in diameter at breast height or larger on the Coast and 7.1 inches in the Interior, between 12-inch high stumps and (usually) 4-inch diameter tops.

CORRIDOR
A continuous strip of land or water connecting two geographically separate points and used for the conveyance of humans, animals, goods, energy or information. It refers to roads, railways, pipelines and power transmission facilities, to waterways like the Inside Passage and to wildlife migration corridors.

CRITICAL HABITAT
Habitat that is crucial to the size, distribution or stability of a wildlife or fish population.

DIRECT FOREST REVENUES
Revenues that accrue to the provincial government from the stumpage, royalties, lease and licence fees paid by holders of timber harvesting tenures.

ECOSYSTEM
A forest ecosystem is a complex system of biophysical processes and living organisms and other interacting components and processes. It comprises plants, animals and microbes, interacting with soil and climate.

ENVIRONMENTALLY SENSITIVE AREA

Areas requring special management attention to protect and prevent permanent damage to important scenic values, fish and wildlife resources, historical and cultural values, and other natural systems or processes. They are also identified as requiring special management attention to protect life and safety from the risk of natural hazards.

EVEN-AGED MANAGEMENT

Even-aged management produces a final harvest in which all or most of the older trees are removed and a relatively even-aged new tree crop is established.

FOREST LICENSEE

The holder of a Tree Farm Licence, Forest Licence, Pulpwood Agreement, Timber Sale Licence, or Timber Licence under the Forest Act.

FOREST LICENCES

A forest licence allows an orderly timber harvest over a portion of a sustained-yield management unit and the timely reforestation of harvested areas according to a strategic resource management plan prepared by the BCFS for the timber supply area. The licence has:
a term of 15 to 20 years, replaceable every five years (some are non-replaceable); and, operating areas which continuously shift over time within the timber supply area - once an area is harvested and reforested, the licensee moves to another part of the timber supply area.

FOREST SECTOR

In the context of studies conducted for this report consists of the following industries: extractive logging and forestry, wood mills (eg. lumber, plywood, shakes and shingles), and pulp, paper and allied.

GROSS DOMESTIC PRODUCT (GDP)

The value of production of goods and services in the economy resulting from the factors of production, in particular from capital, whether of Canadians or of non-residents.

GROSS PROVINCIAL PRODUCT (GPP)

As opposed to GDP, this measures the total value of production attributable to the residents of a given region during a particular time frame, regardless of where that production takes place.

INTEGRATED RESOURCE MANAGEMENT

The comprehensive management of two or more natural resources over a defined area with regards to maintaining, or enhancing where possible, resource quality in perpetuity, and to avoiding permanent or long-lasting damage to any resource so that the resources are managed in a manner compatible with present and foreseeable future needs.

INTEGRATED RESOURCE PLANNING

A flexible and consultative decision-making process which examines the interaction of various resources, resource uses, developments and trends, and provides for interaction with stakeholders in the search for information, shared values, consensus, and action that is both feasible and

INTENSIVE SILVICULTURE
Improvement of natural stands or plantations with the intention of increasing yield. Techniques include thinning, brushing, weeding, limbing and fertilization.

INTERMEDIATE UTILIZATION
A measure of the sound timber in a stand, contained in all trees 13.1 inches in diameter at breast height or larger on the Coast and 11.1 inches in the Interior, between 18-inch high stumps and 8-inch diameter tops.

INVENTORY
The stock of a resource occurring in an area of land, measured to a specified standard such as species, age or size.

LAND USE CLASSIFICATION
A process of assigning similar characteristics, capabilities and uses that reflects the individual ecosystems of the provincial land base.

LAND USE PLAN
A plan for a portion of a Timber Supply Area or Tree Farm Licence which integrates management guidelines for resource uses in the area. A local Resource Use Plan refines the objectives set out in Forest Land Management Plans.

LOCAL RESOURCE USE PLANNING (LRUP)
Within the context of management strategies for a Timber Supply Area or Tree Farm Licence, local resource use planning establishes integrated resource management guidelines for areas where resource use development is proposed. Local planning can range from extensive appraisal to intensive study and is carried out to enable development planning to proceed.

LONG RUN SUSTAINED YIELD
A measure of the productive, long-term carrying capacity of a defined area for specified management assumptions.

MANAGEMENT AND WORKING PLAN
A Management and Working Plan for a Tree Farm Licence or a Forest Licence, as required by the Forest Act and within licence documents.

MANUFACTURING SHIPMENTS
Similar to the value of production, measured at the factory gate.

MICROCLIMATE
The essentially uniform local climate of a usually small site or habitat.

NATURAL RESOURCE
A renewable or non-renewable element of the natural environment having a tangible or intangible value which is produced, developed, or utilized for social and/or economic benefits.

NOT SATISFACTORILY RESTOCKED (NSR) LAND
Refers to productive forest land denuded by logging or fire that still lacks a desired number of trees in "free to grow" condition.

OLD GROWTH
There is no single definition of old growth but the term is generally agreed to refer to a relatively old and undisturbed forest. An old growth forest contains live and dead trees of various sizes, species composition, and age class structure that are part of a slowly changing but dynamic ecosystem. The age and structure of old growth varies

PRE-HARVEST SILVICULTURE PRESCRIPTION (PHSP)
A site-specific management plan, since 1987 a legal pre-requisite to logging on Crown land. Pre-harvest prescriptions specify planned forest activities, the methods to be used and the proposed constraints necessary to protect the site and its resource values.

PROVINCIAL FORESTS
A designation under the Forest Act. Land that is deemed to provide the greatest contribution to the social and economic welfare of the province if predominantly maintained in successive crops of trees or forage, or both, or maintained as wilderness. Currently about 85% of the province.

PUBLIC SUSTAINED YIELD UNIT (PSYU)
Introduced in the province after the Sloan Report of 1945 as a form of tenure to be managed by the Forest Service for sustained yield. Later known as Timber Supply Areas.

PULPWOOD AGREEMENTS
A pulpwood agreement provides the holder of a wood residue processing facility, without competition, a supply of wood fibre from pulpwood stands, if sufficient quantities of wood residues, or by-products of conventional timber processing, are not available to the holder.
An agreement covers:

- a 25-year term, and may be replaceable every 10 years;
- a large area in one or more timber supply areas.
- Harvesting authority is provided through a timber sale licence where the licensee is responsible for all operational planning, development, basic silviculture and forest protection.

RANGE LAND
Land used for grazing by domestic livestock and wildlife including grasslands and forest lands with an understorey or periodic cover of herbaceous or shrubby vegetation.

REFORESTATION
The natural or artificial restocking of previously forested lands.

REGENERATION
The process by which a forest is renewed.

ROTATION
The age at which a forest crop is harvested and replaced by a new stand.

ROYALTY
The payment due to the Crown for timber harvested from private lands granted in British Columbia since 1887 and from old temporary tenures.

SECOND GROWTH
A stand of timber that has replaced a former or old growth stand and is in an immature or thrifty condition.

SELECTION LOGGING
The removal of mature trees, usually the oldest or largest, either as single scattered trees or small groups at relatively short intervals. The system promotes a forest of uneven age.

SELECTIVE LOGGING
A harvesting system that removes only a desired species or size of tree.

SHELTERWOOD LOGGING
The removal of a substantial number of trees from a stand, leaving enough of the original stand to provide shelter and shade for a succeeding generation.

SILVICULTURE
The science and art of growing and tending forest crops.

SNAG
A standing dead tree from which the leaves and most of the branches have broken off.

STAND
A community of trees with sufficient uniformity of species, age and condition as to form a distinctive entity as a silvicultural or management unit.

STEWARDSHIP
For forests, stewardship is the constructive use and development of the forests, measured against a long-term standard of trusteeship.

STUMPAGE
The price paid to the government by licensees for the cutting of trees on Crown land. Calculated since 1987 by what is known as comparative value pricing, licensees pay stumpage reflecting the value of their timber stand relative to the value of an average stand in their region.

SUSTAINED YIELD
The yield that a forest can produce continuously at a given intensity of management without impairment of the productivity of the land. The intention is a balance between timber growth and harvesting on a sustainable basis.

TENURE
An agreement that confers on licensees the right to harvest a certain volume of timber on Crown land within a certain timeframe.

TIMBER SALE LICENCES
This licence allows the orderly harvest of relatively small volumes of timber by:
operators with small allowable annual cuts;
operators registered under the small business forest enterprise program or others with temporary cutting rights; and,
holders of pulpwood agreements.

TIMBER SUPPLY AREA (TSA)
In TSAs (which are a revision to and a consolidation of the former Public Sustained Yield Units) the forest companies manage the timber resource according to strategic resource management plans prepared by the Forest Service. The most common timber tenures in a TSA are the Forest Licence and the Timber Sale Licence. There are 35 TSAs in British Columbia and 32 TFLs.

TREE FARM LICENCES
The tree farm licence is a 'stewardship' agreement over a sustained-yield management unit. This includes the right to harvest a specified volume of timber annually and the obligation to carry out all phases of forest management on behalf of the BCFS. The licence has:
a 25-year term, replaceable every 10 years; and, fixed boundaries.

VALUE ADDED
The additional income generated by further processing beyond raw material stage up to final 'end use' product.

VANCOUVER LOG MARKET
A clearinghouse for exchanges of logs and chips. Prices from the Vancouver Log Market are used as part of stumpage calculations.

VISUAL QUALITY OBJECTIVE
The activity by which visual and aesthetic landscape values are identified, inventoried, and analyzed, and are protected, or enhanced, according to their relative importance within the integrated resource use management plans and during resource development. Refers to degree of acceptable alteration of the characteristic landscape.

WATERSHED
The area drained by a river, stream or other waterway.

WILDERNESS
An area of land greater than 1,000 hectares that predominantly retains its natural character and on which the impact of man is transitory, minor and in the long run substantially unnoticeable.

WOODLOT LICENCE
Small, area-based tenure not attached to processing facilities. Originally developed as an adjunct to ranching to provide seasonal employment opportunities.

Note: These definitions are in accord with the manner in which the respective terms have been used and interpreted in the context of this report.